MC-7130-MP User's Manual

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www.moxa.com/product

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MC-7130-MP User's Manual

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1

Introduction

The MOXA MC-7130-MP marine computer is powered by the third generation Intel® Core™ i3 3120ME processor and offers a wide range of I/O connectivity that includes eight NMEA 0183 ports, four serial ports, four Gigabit Ethernet ports, six USB 2.0 and two SuperSpeed USB 3.0 ports. In addition, it also provides a third generation PCIe x16 slot alongside two standard PCI slots, allowing versatile peripheral expansion for industrial applications.

The MC-7130-MP's rugged and fanless design and 1G anti-vibration make it particularly well-suited for bridge systems in marine applications. In addition, the compact size and low power consumption ensure an easy installation and dependable service, while its modular design allows easy integration with existing displays.

Users can easily install Windows 7, Windows XP SP3, or Windows XP Embedded to provide a flexible and friendly environment for system development and application implementation.

The following topics are covered in this chapter:

- **Overview**
- **Package Checklist**
- **Product Features**
- **Hardware Specifications**
  - Hardware Block Diagram

Overview

The MOXA MC-7130-MP marine computer is powered by the third generation Intel® Core™ i3 3120ME processor and offers a wide range of I/O connectivity including eight NMEA 0183 ports, four serial ports, four Gigabit Ethernet ports, six USB 2.0 and two SuperSpeed USB 3.0 ports. In addition, it also provides a third generation PCIe x16 slot alongside two standard PCI slots, allowing versatile peripheral expansion for industrial applications.

Users can also choose to install Windows 7, Windows XP SP3, or Windows XP Embedded operating systems to provide a flexible and friendly environment for system development and application implementation.

Package Checklist

One MC-7130-MP:
A ready-to-run x86 computing platform with Intel Core™ i3 3120E, 4 serial ports, 4 Gigabit Ethernet ports, 6 USB hosts, 8 NMEA ports, storage drives, and VGA/DVI-D video outputs.

Each model ships with the following items:

- 1 MC-7130-MP marine computer
- 2 storage protection locks (with keys)
- 8 screws for drive mounts
- Wall mounting kit, with 6 screws
- 1 terminal block for DC power input
- 2 6-pin digital input terminal blocks
- 2 8-pin digital output terminal blocks
- 8 NMEA 0183 ports
- Documentation and driver CD
- Quick Installation Guide (printed)
- Warranty card

NOTE Please notify your sales representative if any of the above items are missing or damaged.

Product Features

The MC-7130-MP embedded computer has the following features:

- High-performance 3rd generation Intel Core i3 3120ME processor
- Built-in 4 GB DDR3 memory, with additional capacity up to 16 GB
- Supports three independent displays (2 DVI-D + 1 VGA)
- 4 Gigabit Ethernet ports for network redundancy
- 1 PCIe (x16) slot, 2 universal PCI slots
- 2 software-selectable RS-232/422/485 serial ports
- 2 RS-232 ports
- 8 NMEA 0183 ports
- 6 USB 2.0 hosts, 2 USB 3.0 ports
- 2 integrated SATA 6 Gbps and 2 SATA 3 Gbps interfaces for high speed storage expansion
- Trusted Platform Module: integrated hardware-level security for maximum data protection
- 1G anti-vibration design for system reliability
- 24 VDC and 100 to 240 VAC power input
- Supports Windows XP Embedded, Windows XP SP3, or Windows 7

Hardware Specifications

Computer

CPU: 3rd generation Intel Core i3 3120ME 2.4 GHz processor

OS: Windows 7, Windows XP SP3, or Windows XP Embedded (must be installed by the user)

System Chipset: Intel® QM77 Express Chipset

DRAM: 4 GB DDR3 SDRAM, expandable up to 16 GB

USB: 6 USB 2.0 hosts, 2 USB 3.0 hosts; Type A connectors

Storage

Storage Support:

- 2 SATA 6 Gb/s ports for SSD/HDD
- 2 SATA 3 Gb/s ports for SSD/HDD

Other Peripherals

KB/MS: 2 PS/2 interfaces supporting standard PS/2 keyboard and mouse

Audio: line-in/out/microphone interface

LPT Port: 1

Universal PCI Expansion Adaptor

- PCIe (x16): 1
- PCI: 2

Display

Graphics Controller: Onboard Intel® HD graphics 4000

Display Interface:

- VGA Interface: 15-pin D-Sub connector (female), with resolution up to 1920 x 1080
- DVI-D Interface: two 29-pin DVI-D connector (female), with resolution up to 1600 x 1200, 60Hz (with reduced blanking)

Ethernet Interface

LAN: 4 auto-sensing 10/100/1000 Mbps ports (RJ45)

Magnetic Isolation Protection: 1.5 KV built in

Serial Interface

Serial Standards:

- 2 RS-232/422/485 ports, software-selectable (DB9 male)
- 2 RS-232 ports (DB9)
- 8 NMEA 0183 ports (terminal block)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485

Baudrate: 50 bps to 115.2 Kbps

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND

RS-422: TxD+, TxD-, RxD+, RxD-, GND

RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND

RS-485-2w: Data+, Data-, GND

Digital Input

Input Channels: 8, source type

Input Voltage: 0 to 30 VDC at 25 Hz

Digital Input Levels for Dry Contacts:

- Logic level 0: Close to GND
- Logic level 1: Open

Digital Input Levels for Wet Contacts:

- Logic level 0: +3 V max.
- Logic level 1: +10 V to +30 V (Source to DI)

Connector Type: 6-pin screw terminal block, x 2

Isolation: 3 KV optical isolation

Digital Output

Output Channels: 8, sink type

Output Current: Max. 200 mA per channel

On-state Voltage: 24 VDC nominal, open collector to 30 VDC

Connector Type: 8-pin screw terminal block, x 2

Isolation: 3 KV optical isolation

LEDs

System: Storage, Power

LAN: 100M/Link x 2, 1000M/Link x 2 (on connector)

Physical Characteristics

Housing: Aluminum, sheet metal

Weight: 8 kg

Dimensions: 322 x 300 x 150 mm (12.68 x 11.81 x 5.91 in)

Mounting: Wall

Environmental Limits

Operating Temperature: -15 to 55°C (5 to 131°F)

Storage Temperature: -20 to 60°C (-4 to 131°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Anti-vibration:

• 0.7 g @ DNV 2.4 (Class A), sine wave, 2-100 Hz, 1 Oct./min., 1.5 hr per axis

• 1 grms @ DNV 2.4, random wave, 3-100 Hz, 2.5 hr per axis

• 2.1 g @ DNV 2.4 (Class C), sine wave, 2-50 Hz, 1 Oct./min., 1.5 hr per axis

Anti-shock: 50 g @ IEC 60068-2-27, half sine wave, 11 ms

Power Requirements

Input Voltage:

• 24 VDC (with tolerance from 18 to 30 VDC, 2-pin terminal block)

• 100 to 240 VAC

Power Consumption: Less than 100 W, 2.5 A @ 24 VDC

Standards and Certifications

Safety: UL 60950-1, DNV 2.4 (Pending), IEC 60945 (4th) (Pending), IACS-E10 (Pending), CCC (GB4943, GB9254, GB17625.1) (Pending)

EMC: EN 55022 Class B, EN 55024-4-2, EN 55024-4-3, EN 55024-4-4, FCC Part 15 Subpart B Class B

Marine: IEC 60945 4th. (Pending), IACS-E10 (Pending)

Green Product: RoHS, cRoHS, WEEE

Reliability

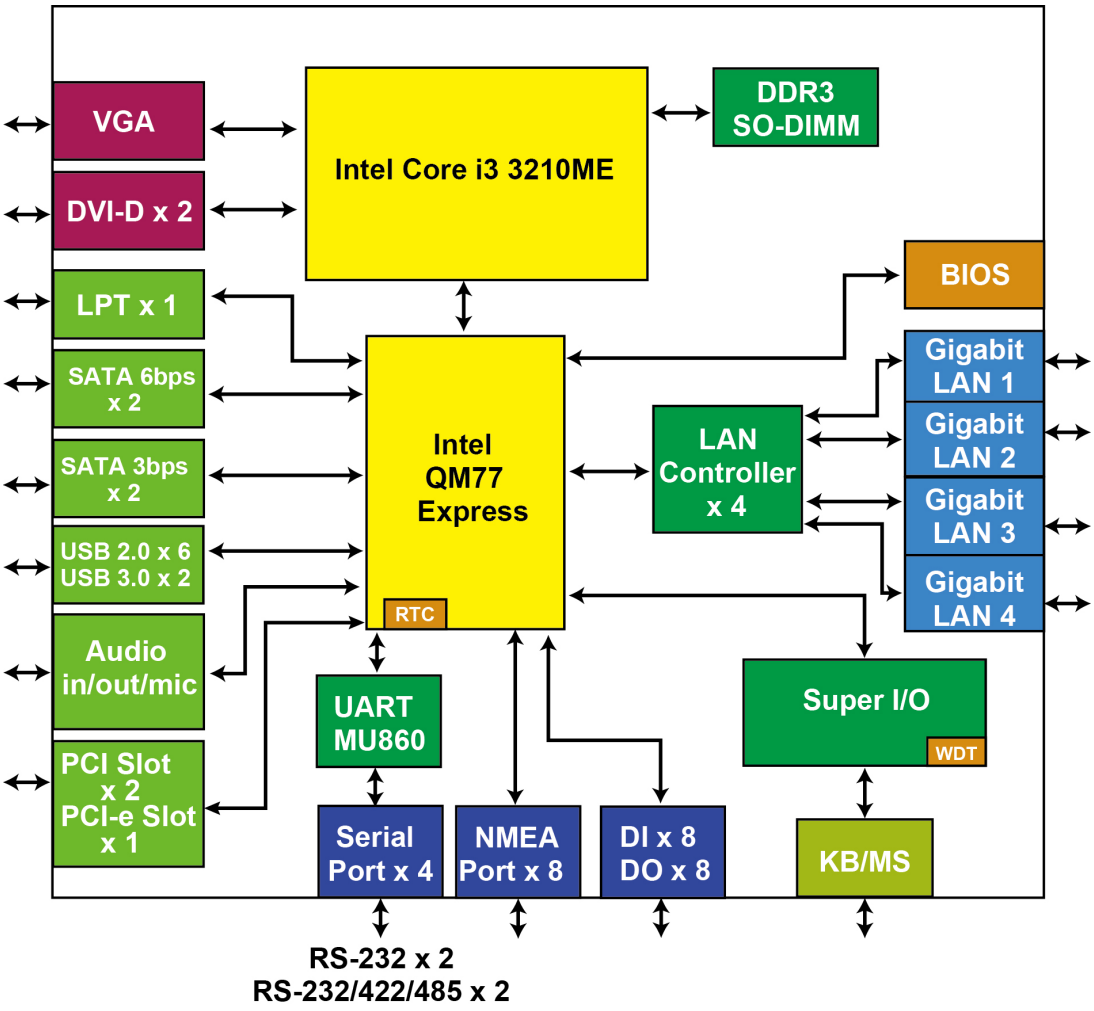
MTBF (mean time between failures): 220,490 hrs

Warranty

Warranty Period: 3 years

Details: See www.moxa.com/warranty

Hardware Block Diagram



2

Hardware Introduction

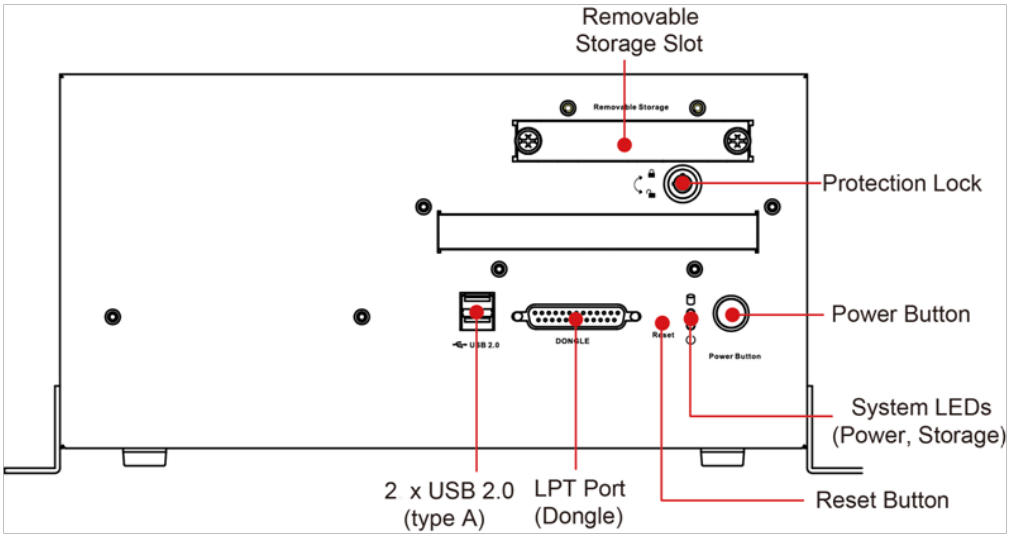
The MC-7130-MP computer is compact, well-designed, and built rugged enough for industrial applications. LED indicators help you monitor performance and identify trouble spots, multiple serial ports allow you to connect different devices, and the reliable and stable hardware platform lets you devote your attention to developing your applications.

The following topics are covered in this chapter:

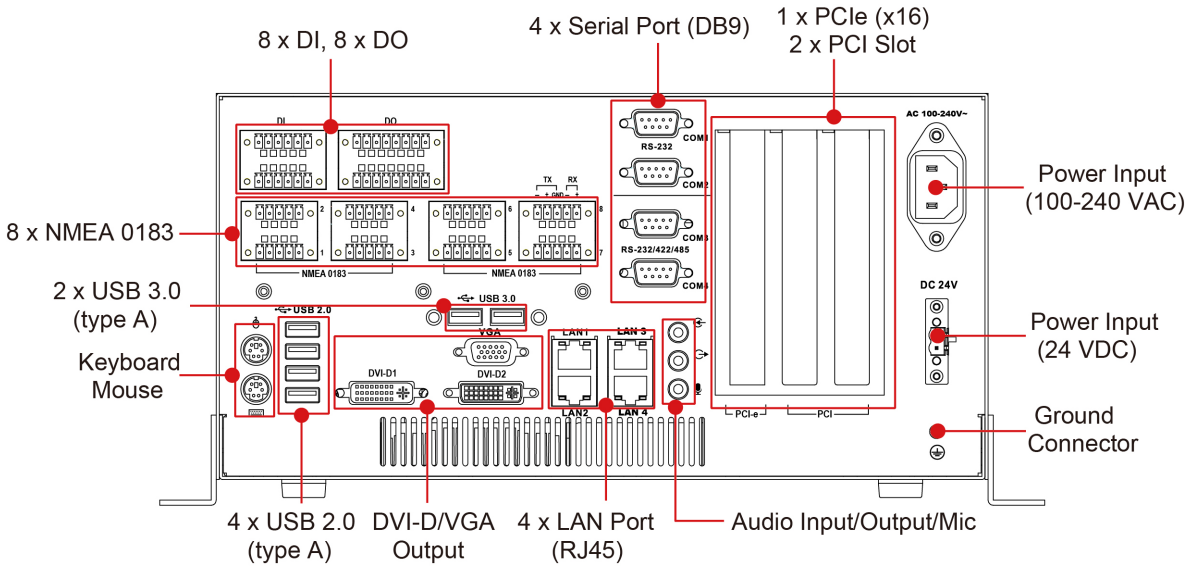
- **Appearance**
  - Front View
  - Rear View
- **Dimensions**
- **LED Indicators**
- **Real Time Clock**

Appearance

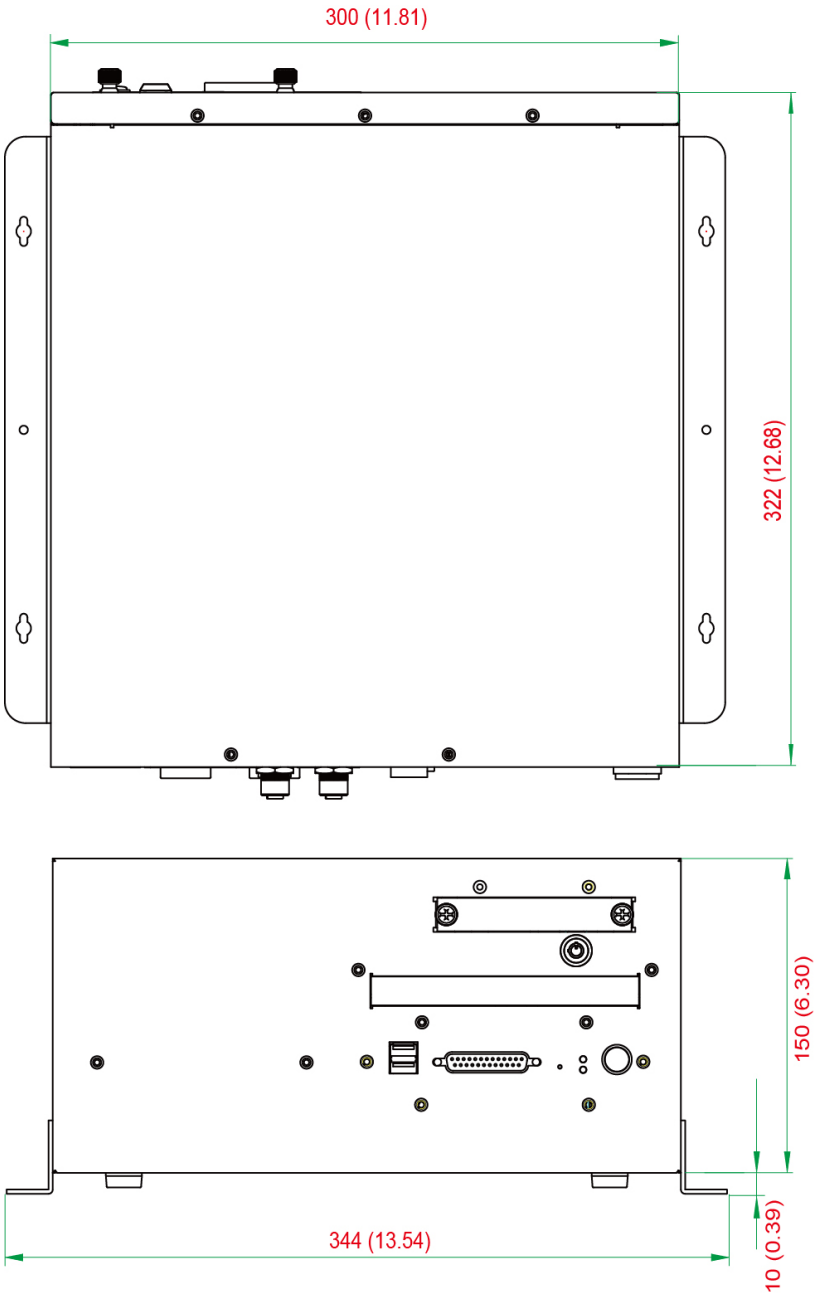
Front View



Rear View



Dimensions



LED Indicators

LED Name	LED Color	LED Function
Power	Green	Power is on and functioning normally
	Off	Power is off or power error exists
Storage	Red (on)	Storage disk is functioning properly
	Red (blinking)	Storage disk is accessing data
	Off	No activity
LAN (1 to 4)	Green	100 Mbps Ethernet mode
	Yellow	1000 Mbps (Gigabit) Ethernet mode
	Off	No activity or 10 Mbps Ethernet mode

Real Time Clock

The embedded computer's real-time clock is powered by a lithium battery. We strongly recommend that you **NOT** replace the lithium battery on your own. If the battery needs to be changed, contact the Moxa RMA service team at http://www.moxa.com/rma/about_rma.aspx.

ATTENTION

Used batteries are environmentally hazardous materials. Dispose of them in the proper manner.

WARNING

There is a risk of explosion if the wrong type of battery is used. To avoid this potential danger, always be sure to use the correct type of battery. Contact the Moxa RMA service team if you have any questions about replacing your battery.

3

Hardware Connection Description

In this chapter, we show how to connect the embedded computers to the network and to various devices.

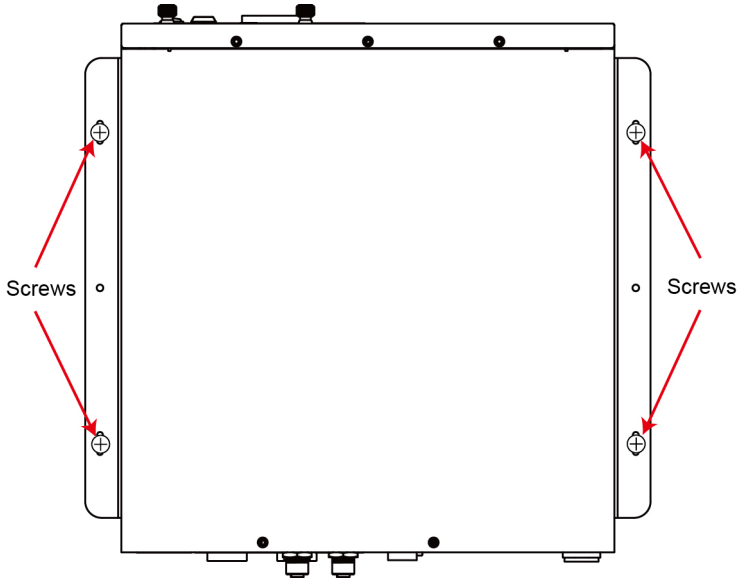
The following topics are covered in this chapter:

- **Installing the MC-7130-MP**
- **Wiring Requirements**
- **Connecting the Power**
- **Grounding the MC-7130-MP**
- **Connecting Data Transmission Cables**
  - Connecting to the Network
  - Connecting to a Serial Device
- **Connecting a PS/2 Keyboard and Mouse**
- **Connecting to the USB Device**
- **Connecting to Digital Input and Output Channels**
- **Connecting to a VGA Monitor**
- **Connecting to a DVI-D Monitor**
- **Connecting to a Speaker/Headphone/Microphone**
- **Installing the Removable SATA Storage Drive**
- **Installing the Internal SATA Storage Drive**
- **Installing PCI and PCIe Cards**
- **Upgrading the Memory Module**

Installing the MC-7130-MP

Wall or Cabinet Mounting

The MC-7130-MP provides two brackets for mounting, either onto walls or into cabinets. Attach the brackets with the screws included on both sides of the chassis.



Wiring Requirements

You should read and follow these common safety precautions before proceeding with the installation of any electronic device:

- Use separate paths to route wiring for power and devices. If power wiring and device wiring paths must cross, make sure the wires are perpendicular at the intersection point.

NOTE Do not run signal or communication wiring together with power wiring in the same wire conduit. To avoid interference, wires with different signal characteristics should be routed separately.

- Use the type of signal transmitted through a wire to determine which wires should be kept separate. The rule of thumb is that wiring that shares similar electrical characteristics can be bundled together.
- Keep input wiring and output wiring separate.
- It is advisable to label the wiring on all devices in the system.

ATTENTION

Safety First!

Be sure to disconnect the power cord before installing and/or wiring your MC-7130-MP.

Wiring Caution!

Calculate the maximum possible current in each power wire and common wire. Observe all electrical codes dictating the maximum current allowable for each wire size.

If the current goes above the maximum ratings, the wiring could overheat, causing serious damage to your equipment.

Temperature Caution!

Be careful when handling the unit. When the unit is plugged in, the internal components generate heat, and consequently the outer casing may feel hot to the touch.

Connecting the Power

The MC-7130-MP comes with a 100 to 240 VAC power input, and also has a 24 VDC power input (via the terminal block). If power is supplied properly, the **Power** LED will light up. The OS is fully initialized when the **Ready** LED lights up to a solid green.

For safety reasons, please use cables with the following specifications:

Wire range: 14-22 AWG

Torque: 7 lb

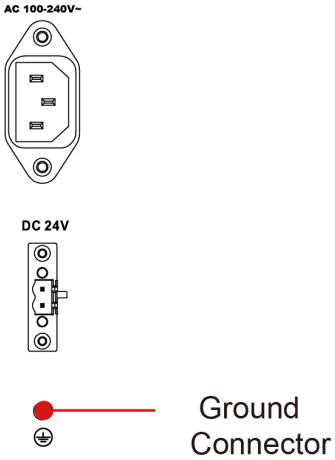
Grounding the MC-7130-MP

Grounding and careful wire routing help limit the effects of noise due to electromagnetic interference (EMI). Run the ground connection from the ground screw to the grounding surface prior to connecting the power.

ATTENTION

This product is intended to be mounted on a well-grounded surface, such as a metal panel.

Earthing/Grounding Wire: See the figure shown below for the location of the earth ground on the terminal block power connector. Connect the EG wire to an appropriately grounded metal surface.



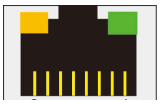
Connecting Data Transmission Cables

This section describes how to connect the MC-7130-MP computer to the network and/or serial devices.

Connecting to the Network

Plug your network cable into the computer's Ethernet port. The other end of the cable should be plugged into your Ethernet networking device. When the cable is properly connected, the LEDs on the embedded computer's Ethernet port will glow to indicate a valid connection.

The 10/100/1000 Mbps Ethernet LAN ports use 8-pin RJ45 connectors. The following diagram shows the pinouts for these ports.



The LED indicators on the right-top (for the upper LAN connector) and right-bottom (for the lower LAN connector) corners glow a solid green color when the cable is properly connected to a 100 Mbps Ethernet network. The LED will flash on and off

when Ethernet packets are being transmitted or received.

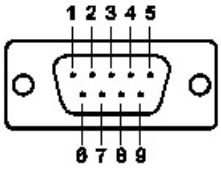
The LED indicators on the left-top and left-bottom corners glow a solid yellow color when the cable is properly connected to a 1000 Mbps Ethernet network. The LED will flash on and off when Ethernet packets are being transmitted or received.

Pin	10/100 Mbps	1000 Mbps
1	ETx+	TRD(0)+
2	ETx-	TRD(0)-
3	ERx+	TRD(1)+
4	---	TRD(2)+
5	---	TRD(2)-
6	ERx-	TRD(1)-
7	---	TRD(3)+
8	---	TRD(3)-

Connecting to a Serial Device

The serial ports use DB9 connectors. COM1 and COM2 can run with RS-232, and COM3 and COM4 run with RS-232, RS-422, or RS-485. The pin assignments are shown in the following table:

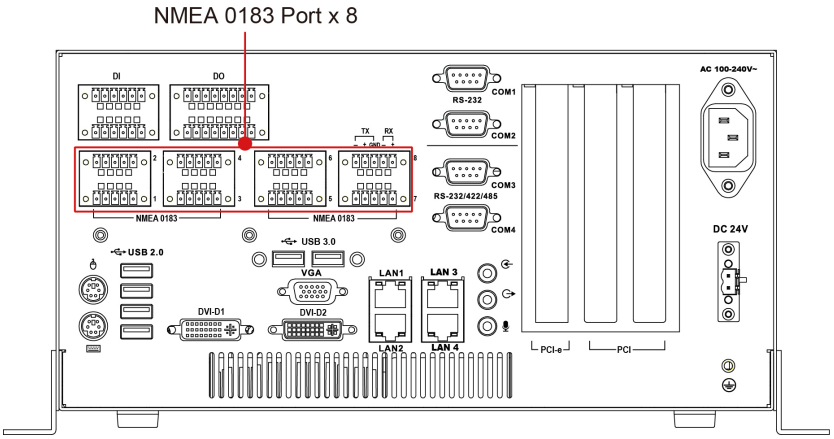
DB9 Male Port

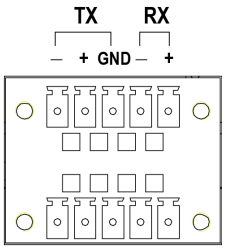


RS-232/422/485 Pinouts

Pin	RS-232	RS-422	RS-485 (4-wire)	RS-485 (2-wire)
1	DCD	TxDA(-)	TxDA(-)	–
2	RxD	TxDB(+)	TxDB(+)	–
3	TxD	RxDB(+)	RxDB(+)	DataB(+)
4	DTR	RxDA(-)	RxDA(-)	DataA(-)
5	GND	GND	GND	GND
6	DSR	–	–	–
7	RTS	–	–	–
8	CTS	–	–	–

Additionally, eight NMEA serial ports with terminal blocks are also available on the rear panel of the computer. Refer to the following figures for the location of the NMEA ports and the pin assignments.

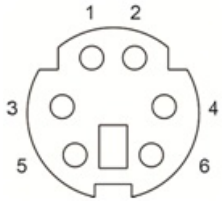




Connecting a PS/2 Keyboard and Mouse

Your MC-7130-MP computer comes with 2 PS/2 mini-DIN connectors on the rear panel to connect to a PS/2 keyboard and PS/2 mouse. This 6-pin mini-DIN connector has the pin assignments shown below.

PS/2 Connector



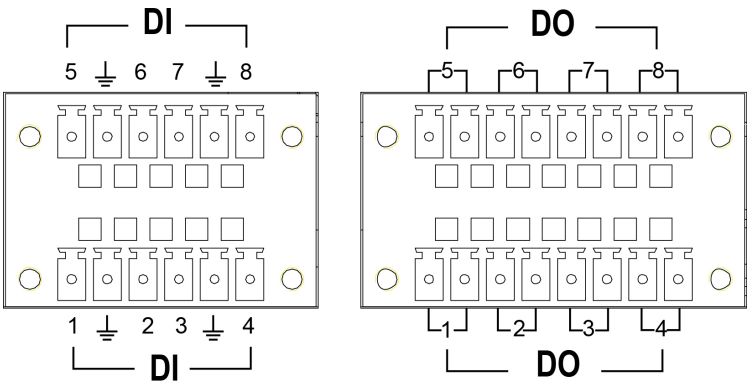
Pin No.	Signal Definition
1	PS/2 Keyboard Data
2	PS/2 Mouse Data
3	GND
4	VCC
5	PS/2 Keyboard Clock
6	PS/2 Mouse Clock

Connecting to the USB Device

The MC-7130-MP comes with two USB 2.0 hosts on the front panel, four USB 2.0 hosts, and two SuperSpeed USB 3.0 hosts on the rear panel. The USB ports support peripherals such as a keyboard or mouse, or storage devices such as a portable HDD or DVD-ROM. Please note that USB 3.0 interfaces are not supported by the Windows XP platform.

Connecting to Digital Input and Output Channels

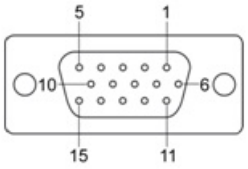
The MP-7130-MP comes with eight digital input and eight digital output channels on the rear panel. These input/output channels can be connected with the terminal blocks which have been included in the package. See the following figure for the pin assignments.



Connecting to a VGA Monitor

The MC-7130-MP comes with a D-Sub 15-pin female connector on the rear panel to connect a VGA CRT monitor. To ensure that the monitor image remains clear, be sure to fasten the monitor cable using the cable's thumbscrews after connecting it to the MC-7130-MP. The pin assignments of the VGA connector are shown below.

DB15 Female Connector

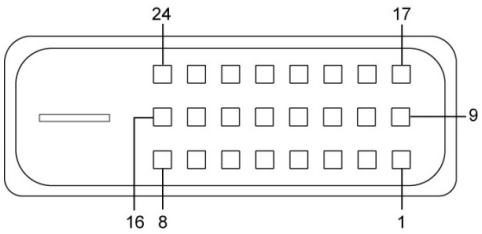


Pin No.	Signal Definition
1	Red
2	Green
3	Blue
4	NC
5	GND
6	GND
7	GND
8	GND
9	VCC
10	GND
11	NC
12	DDC Data
13	HSYNC
14	VSYNC
15	DDC Clock

Connecting to a DVI-D Monitor

The MC-7130-MP computers come with two DVI-D connectors that can connect to DVI monitors. Use the cable to connect one end to the DVI-I connector and the other end to the monitor. See the following table for DVI-D connector pin assignments. Please note that three independent displays are not supported under the Windows XP operating system.

DVI-D Connector



Pin No.	Signal Definition
1	T.M.D.S. Data2-
2	T.M.D.S. Data2+
3	T.M.D.S. Data2/4 Shield
4	N/C
5	N/C
6	DDC Clock
7	DDC Data
8	Analog Vertical Sync
9	T.M.D.S. Data1-
10	T.M.D.S. Data1+
11	T.M.D.S. Data1/3 Shield
12	N/C

Pin No.	Signal Definition
13	N/C
14	+5V Power
15	Ground (return for +5V, HSync, and VSync)
16	Hot Plug Detect
17	T.M.D.S. Data0-
18	T.M.D.S. Data0+
19	T.M.D.S. Data0/5 Shield
20	N/C
21	N/C
22	T.M.D.S. Clock Shield
23	T.M.D.S. Clock+
24	T.M.D.S. Clock-

Connecting to a Speaker/Headphone/Microphone

The MC-7130-MP comes with audio input, output, and microphone interfaces on the rear panel for connecting a microphone, speaker, or headphones.

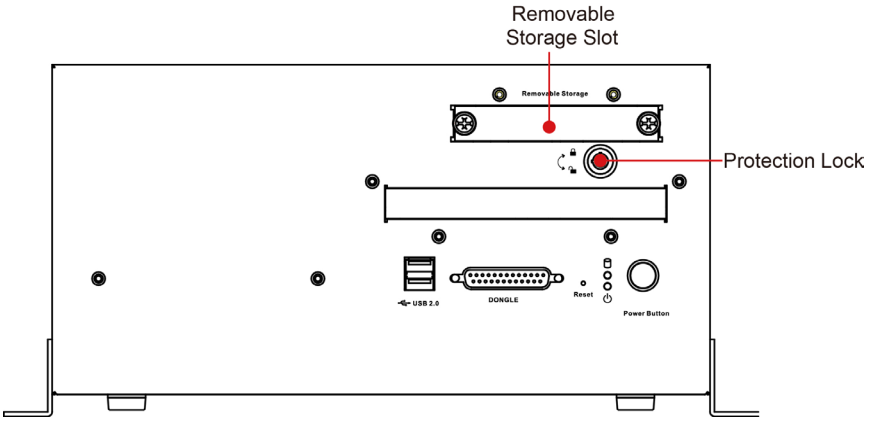
Installing the Removable SATA Storage Drive

IMPORTANT!

Moxa is continually testing SSDs for compatibility with MC-7130-MP computers. As of June 2012, the Memoright MRSAJ6C064GC125C00 and Memoright MRSAD4B060GC225C00 models of SSD have been fully approved for use with MC-7130 devices. However, this is only a partial list and one that is continually growing; for a more up-to-date list of which SSDs are certified compatible with MC-7130 computers, please contact Moxa's technical support team.

The MC-7130-MP computer comes with a removable SATA storage device tray that is accessible through the front panel. Either a SATA hard disk or solid state drive may be installed, but only use of an SSD will ensure full anti-vibration compliance. To install a SATA storage device, please follow these instructions:

1. Disconnect the MC-7130-MP from the power source.
2. To remove the storage device tray, insert the protection key and turn it to the right, then unfasten the two thumbscrews that secure the removable tray. The storage tray's location may be seen in the following figure:



3. Take off the storage bracket from the slot and turn it over to get access to the four screws which will secure the drive to the tray.

4. Place the drive into the tray and secure it using the four screws. When finished, insert the tray into the computer and fasten the tray in place using the two thumbscrews on the front panel. Finally, complete the installation by turning the key leftwards to lock the tray into place.

Installing the Internal SATA Storage Drive

The MC-7130-MP has a SATA connector within the main chassis where a SATA storage drive may be permanently installed. To install a 2.5-inch SATA storage drive, follow these instructions.

IMPORTANT!

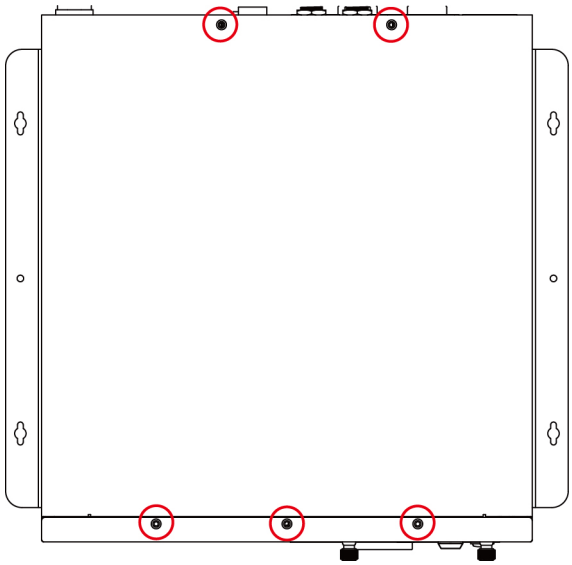
Moxa is continually testing SSDs for compatibility with MC-7130-MP computers. As of June 2012, the Memoright MRSAJ6C064GC125C00 and Memoright MRSAD4B060GC225C00 models of SSD have been fully approved for use with MC-7130-MP devices. However, this is only a partial list and one that is continually growing; for a more up-to-date list of which SSDs are certified compatible with MC-51XX computers, please contact Moxa's technical support team.

Turn over the MC-7130-MP to get access to its bottom panel; remove the four screws on the drive bay cover plate. The following figure shows what the location of the screws:

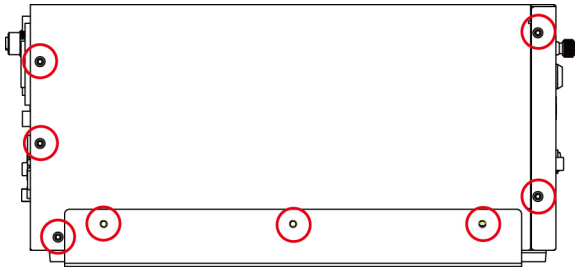
After removing the cover plate, you will need to install the storage drive.

Removing the Computer Chassis

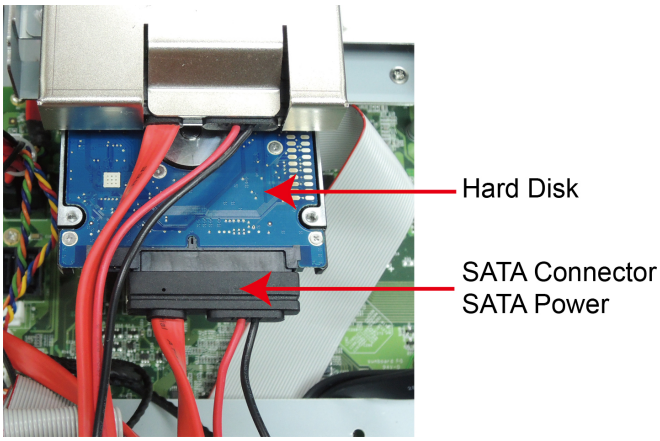
1. Remove the five screws on the top cover of the computer.



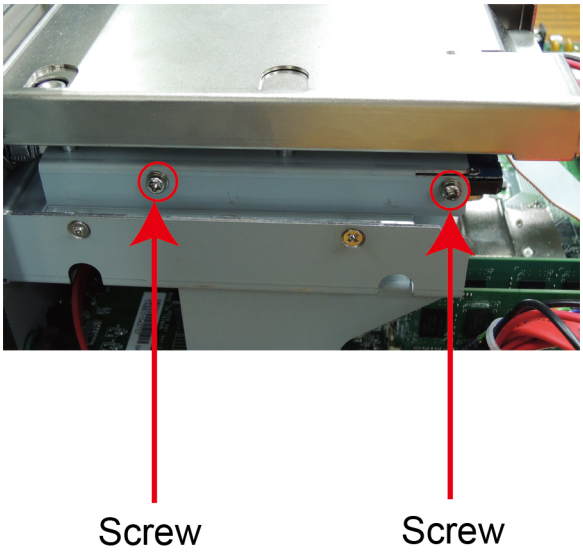
2. Remove the eight screws fastening each side of the computer (16, total).



3. The internal drive slot is located below the removable drive slot. Turn the drive so that its connectors are facing towards you and insert it into the slot. Connect the SATA connector and SATA power cable. When finished, push the drive inward.



4. Fasten the two screws on either side of the HDD slot.

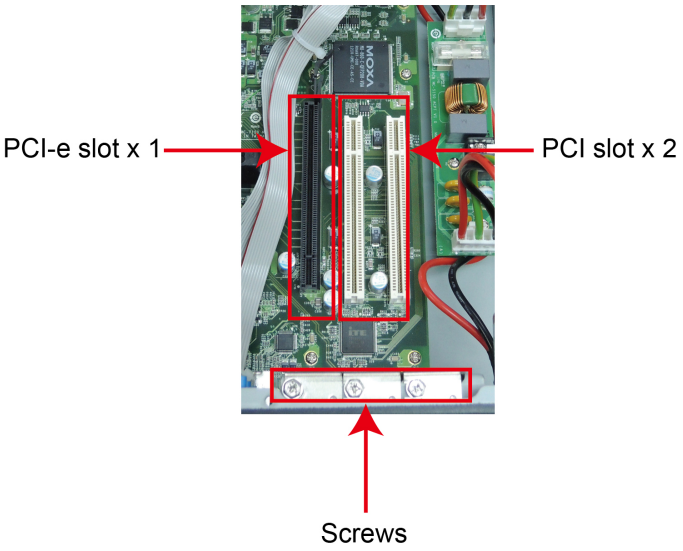


5. Remember to replace the top cover on the computer to complete the installation.

Installing PCI and PCIe Cards

The MC-7130-MP has two universal PCI slots for installing various peripheral cards, such as a RADAR card or PROFIBUS card. Also, a PCIe (x16) card is available for connecting an additional VGA graphic card. To install:

1. Unfasten the computer chassis (see the above section, **Removing the Computer Chassis**).
2. Remove the chassis to expose the PCI slots located in the corner of the computer's motherboard.



3. Remove the screws on the slot protection covers.
4. Insert the PCI card or PCI-e card into the slot, and secure the card to the mounting frame.

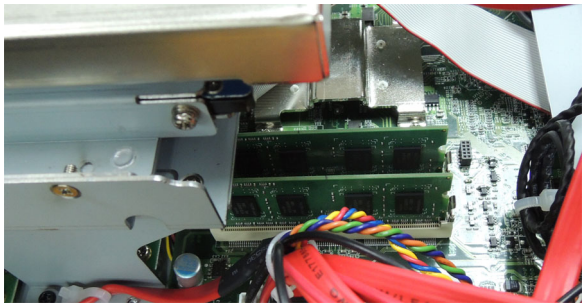
6. When finished, replace the top cover of the computer and complete the installation.

NOTE Due to the limitations of Intel architecture, native PCI bus is not available; a PCIe-to-PCI bridge design is required. For some PCI cards this may reduce performance during I/O space access data transfers.

Upgrading the Memory Module

The MC-7130-MP comes with four gigabytes of pre-installed DDR3 SDRAM, and can support another 12 gigabytes (up to a total of sixteen). If you would like to install more memory modules, please follow the steps below.

1. Remove the cover (see the above section, **Removing the Computer Chassis**).
2. The memory module is located below the internal HDD socket.



3. Simply push the two clutches on both sides of the memory module, and then remove the memory.
4. Carefully slide the module into the clutch at an angle, and then push downward. Make sure the module has been firmly inserted and is oriented correctly.

4

BIOS Setup

This chapter describes the BIOS settings of the MC-7130-MP computer. The BIOS is a set of input/output control routines for peripherals. The BIOS is used to initialize basic peripherals and helps boot the operating system before the operating system is loaded. The BIOS setup allows the user to modify the system configurations of these basic input/output peripherals.

The following topics are covered in this chapter:

- **Entering the BIOS Setup Utility**
  - Main Information
- **Advanced Settings**
  - Boot Configuration
  - Peripheral Configuration
  - HDC Configuration
  - Video Configuration
  - Chipset Configuration
  - Hardware Monitor
- **Security Settings**
  - TPM Status
  - TPM Operation
  - Set Supervisor Password
- **Power Settings**
  - Advanced CPU Control
- **Boot Settings**
  - Boot Type
  - Quick Boot
  - PXE Boot to LAN
  - Add Boot Options
  - USB Boot
  - EFI Device First
  - Boot Delay Time
  - Legacy
- **Exit Settings**
  - Exit Saving Changes
  - Save Change Without Exit
  - Exit Discarding Changes
  - Load Optimal Defaults
  - Load Custom Defaults
  - Save Custom Defaults
  - Discard Changes
- **Upgrading the BIOS**

Entering the BIOS Setup Utility

To enter the BIOS setup utility, press the "F2" key while the system is booting up. The main **BIOS Setup** screen will appear. Select **SCU** to enter the **BIOS configuration**.

A basic description of each function key is listed at the bottom of the screen. Refer to these descriptions to learn how to scroll about the screen, how to select by pressing "Enter," and how to use the other hot keys listed below.

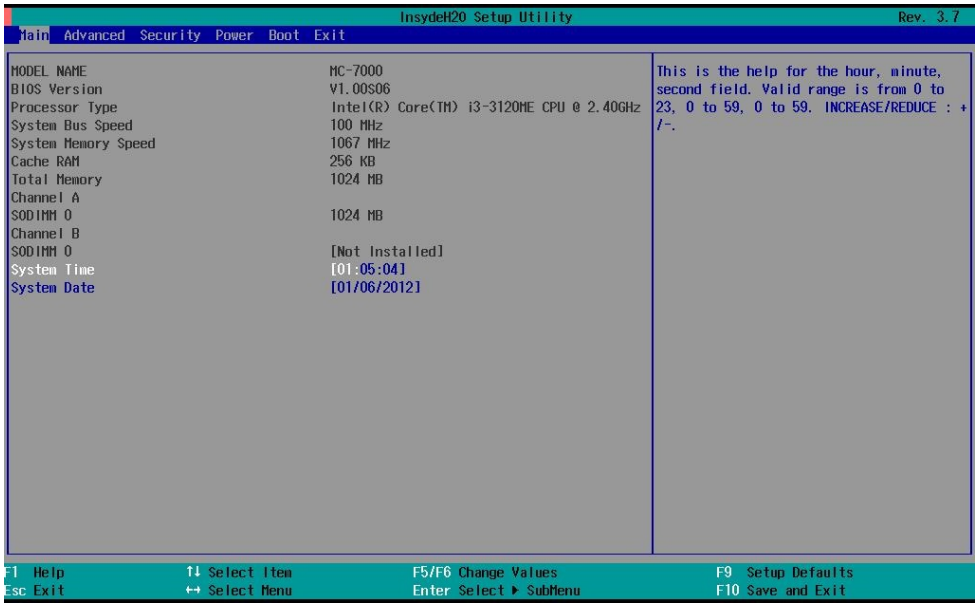
F1: General Help

F5/F6: Change Values

F9: Setup Defaults

F10: Save and Exit

ESC: Exit

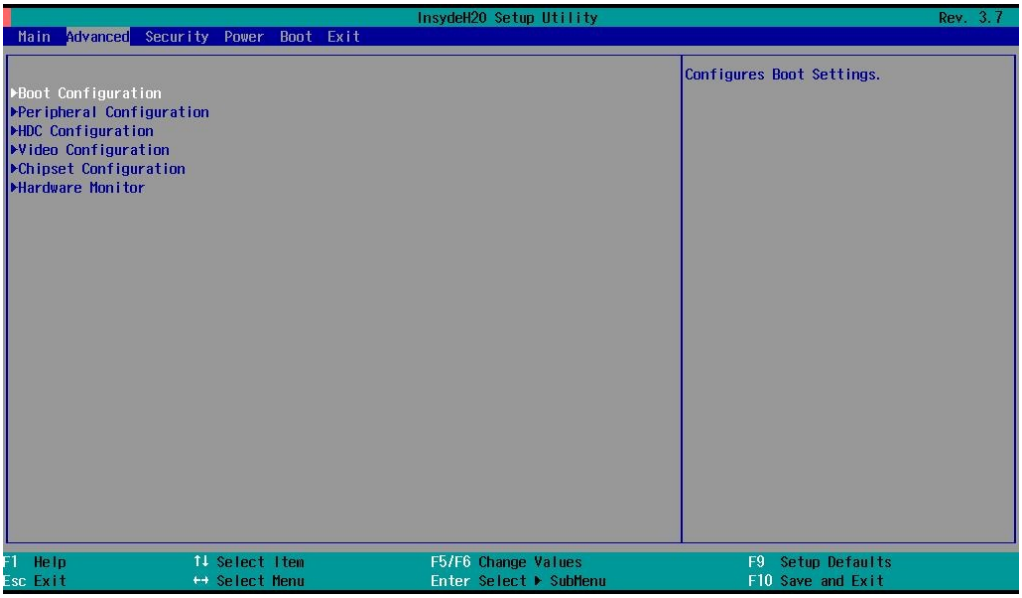

InsydeH20 Setup Utility Rev. 3.7
Main Advanced Security Power Boot Exit
MODEL NAME MC-7000
BIOS Version V1.00S06
Processor Type Intel(R) Core(TM) i3-3120ME CPU @ 2.40GHz
System Bus Speed 100 MHz
System Memory Speed 1067 MHz
Cache RAM 256 KB
Total Memory 1024 MB
Channel A
SODIMM 0 1024 MB
Channel B
SODIMM 0 [Not Installed]
System Time [01:05:04]
System Date [01/06/2012]
This is the help for the hour, minute, second field. Valid range is from 0 to 23, 0 to 59, 0 to 59. INCREASE/REDUCE : +/-.
F1 Help ↑↓ Select Item F5/F6 Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ SubMenu F10 Save and Exit

Main Information

The main page indicates the system information, such as model name, BIOS version, and CPU type. User may view the basic system hardware information in the page.

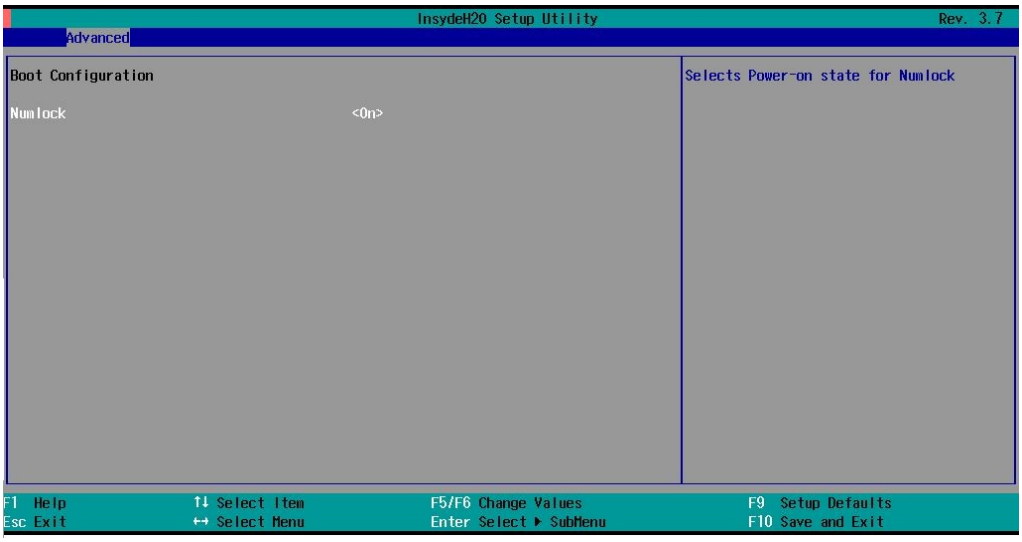
Advanced Settings

The "Advanced Features" screen will appear when choosing the "Advanced" item from the main menu.



Boot Configuration

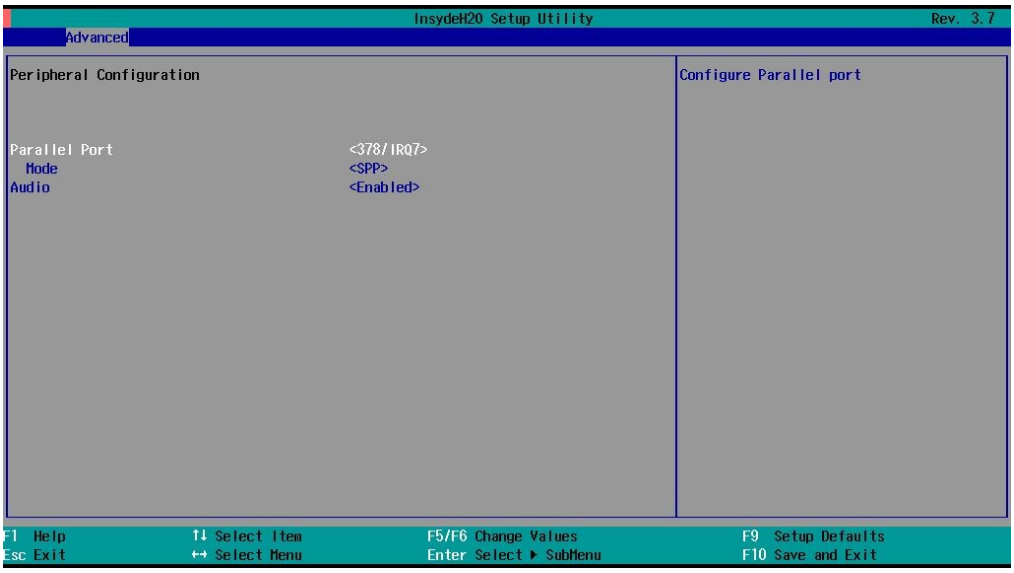
This item allows users to configure the default value of Numlock.



Option: On (default), Off.

Peripheral Configuration

This item allows you to configure the parallel port and audio device.



Parallel Port

This item allows you to configure the parallel port.

Options: 378/IRQ7 (default), Disabled

Mode

This setting allows you to configure the mode for the parallel port.

Options: SPP (default), EPP, ECP, EPP+ECP

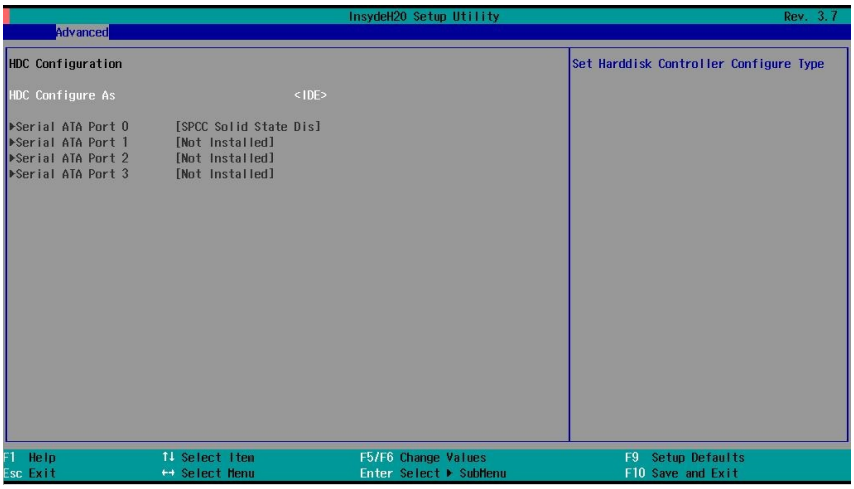
Audio

The item allows you to configure if the system will automatically detect the Audio codec.

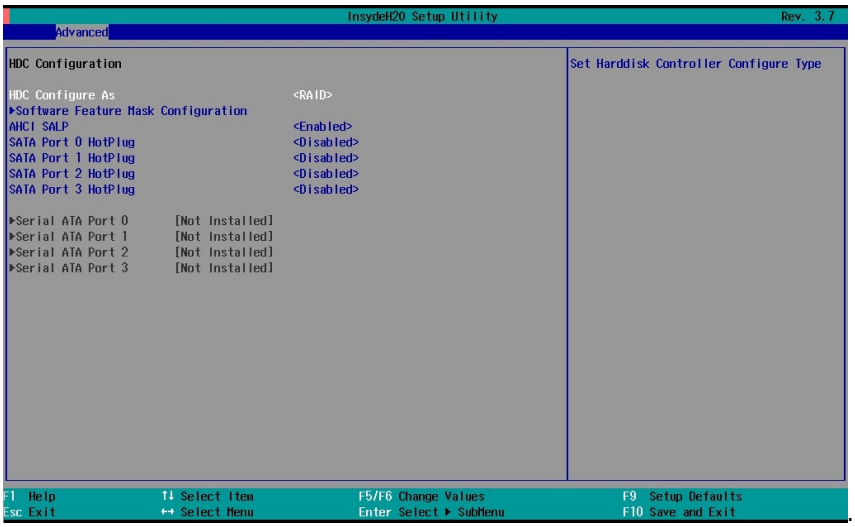
Options: Enabled (default), Disable.

HDC Configuration

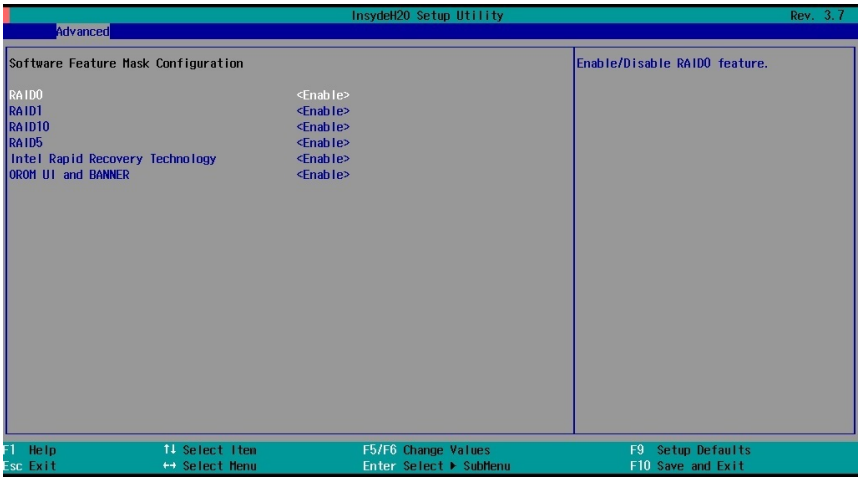
The host drive controller may be configured for IDE (legacy default), AHCI, or RAID mode. When the legacy IDE mode is selected, the following screen will appear.


InsydeH20 Setup Utility Rev. 3.7
Advanced
HDC Configuration
HDC Configure As <IDE>
Serial ATA Port 0 [SPCC Solid State Dis]
Serial ATA Port 1 [Not Installed]
Serial ATA Port 2 [Not Installed]
Serial ATA Port 3 [Not Installed]
Set Harddisk Controller Configure Type
F1 Help ↑↓ Select Item F5/F6 Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ SubMenu F10 Save and Exit

The **RAID** screen will appear like this. Select **Software Feature Mask Configuration** to choose which RAID configuration you want to set up.


InsydeH20 Setup Utility Rev. 3.7
Advanced
HDC Configuration
HDC Configure As <RAID>
Software Feature Mask Configuration
AHCI SALP <Enabled>
SATA Port 0 HotPlug <Disabled>
SATA Port 1 HotPlug <Disabled>
SATA Port 2 HotPlug <Disabled>
SATA Port 3 HotPlug <Disabled>
Serial ATA Port 0 [Not Installed]
Serial ATA Port 1 [Not Installed]
Serial ATA Port 2 [Not Installed]
Serial ATA Port 3 [Not Installed]
Set Harddisk Controller Configure Type
F1 Help ↑↓ Select Item F5/F6 Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ SubMenu F10 Save and Exit

The **Software Feature Mask Configuration** will appear as below.


InsydeH20 Setup Utility Rev. 3.7
Advanced
Software Feature Mask Configuration
RAID0 <Enable>
RAID1 <Enable>
RAID10 <Enable>
RAID5 <Enable>
Intel Rapid Recovery Technology <Enable>
OROM UI and BANNER <Enable>
Enable/Disable RAID0 feature.
F1 Help ↑↓ Select Item F5/F6 Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ SubMenu F10 Save and Exit

RAID 0 is a simple striping of information across two drives. It offers marginal improvements in access times for substantial sacrifices in system reliability. **RAID 1** offers full data redundancy across two drives, providing

significant improvements in data security and system reliability. **RAID 10** offers the best of both **RAID 0** and **RAID 1**, using four drives to give moderate improvements in disk access times, but with full mirroring of each drives on two more backup drives to provide full data redundancy and backup. **RAID 5** is a three-disk-or-more array where data is striped and parity is distributed and reduplicated across all drives. This enables the array to sustain the failure of one of the drives without the loss of any data, and without the array going down. However, with the loss of any single drive the array performance will decrease. Also, when configuring a **RAID 5** architecture, remain aware of the potential for encountering the RAID 5 write hole problem, and take precautions against it.

Serial ATA Port 0 to 3

This setting allows the user to display information about the installed drives.

AHCI SALP

This item allows you to enable aggressive **link power management** (SALP) in AHCI. SALP enables the host bus adapter to conserve power by directly detecting when a SATA drive is no longer processing information and then immediately shifting it into suspended or sleep modes without waiting for software processes to initiate power-down processes.
Host Capability Register bit 26.

Options: Enabled (default), Disabled

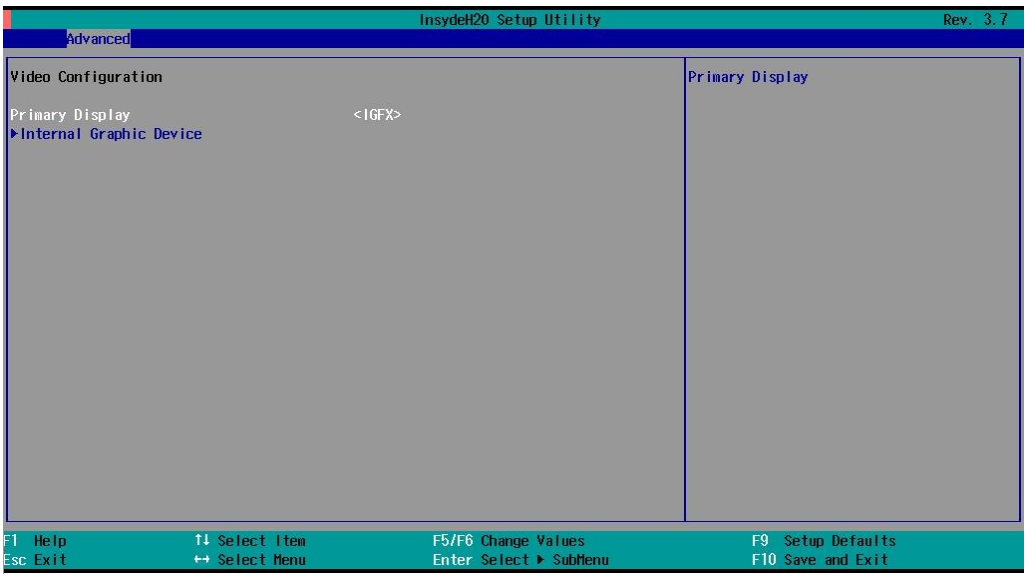
SATA Port 0 to 3 - HotPlug

This item allows you to enable/disable hotplug capabilities (the ability to remove the drive while the computer is running) for installed storage drives.

Options: Disable (default), Enabled

Video Configuration

This item allows you to configure the integrated graphics device (IGD) for things like memory allocation (**DVMT**) and monitor types (**Boot Type**).



Internal Graphics Device

This option allows you to enable/disable the internal graphics device.

Options: Enable (default), Disable

IGD—DVMT Pre-Allocated

Options: 64 MB (default), 32 MB, 96 MB, 128 MB, 256 MB, 512 MB
From Intel: **DVMT** is a BIOS solution where "the optimum amount of memory is dynamically allocated and de-allocated as needed for balanced graphics and system performance, through Intel® Direct AGP and a highly efficient memory utilization scheme. DVMT ensures the most efficient use of available system memory resources for maximum 2D/3D graphics performance."
This item allows you to configure pre-allocated memory capacity for the IGD. Pre-allocated graphics memory is invisible to the operating system.

IGD—DVMT Size

This item allows you to configure the maximum amount of memory DVMT will use when allocating additional memory for the internal graphics device.

Options: 256 MB (default), 128 MB, Max

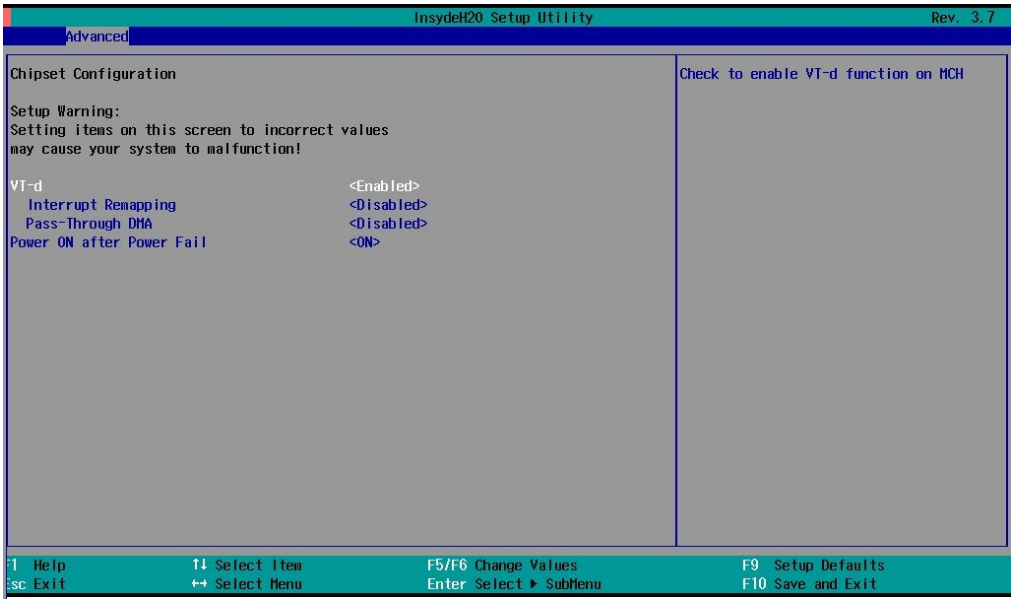
IGD – Boot Type

This item allows you to select the video device which will be activated during POST.

Options: VBIOS Default (default), VGA, DVI-D2, DVI-D1

Chipset Configuration

This item allows you to configure the chipset settings.



VT-d

This item allows you to enable/disable the **VT-d** function.

Options: Enable (default), Disable

Interrupt Remapping

This item allows you to remap interrupts to different address to resolve interrupt conflicts.

Options: Disable (default), Enable

Pass-Through DMA

This item allows you to enable/disable **Pass-Through DMA** function.

Options: Disable (default), Enable

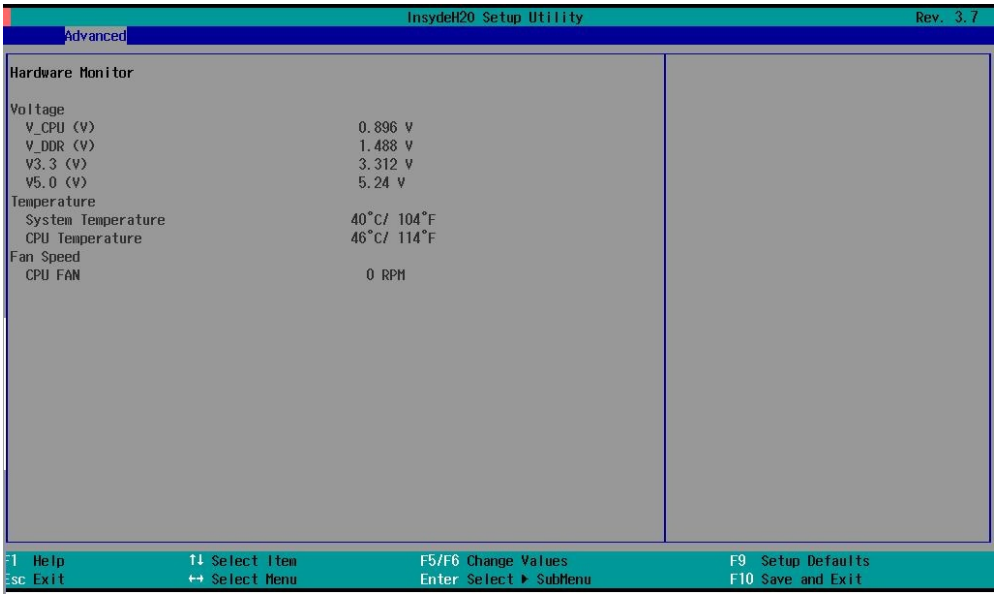
Power ON after Power Fail

This item allows you to enable/disable the computer form automatically powering up after a system crash.

Options: ON (default), OFF, Last State

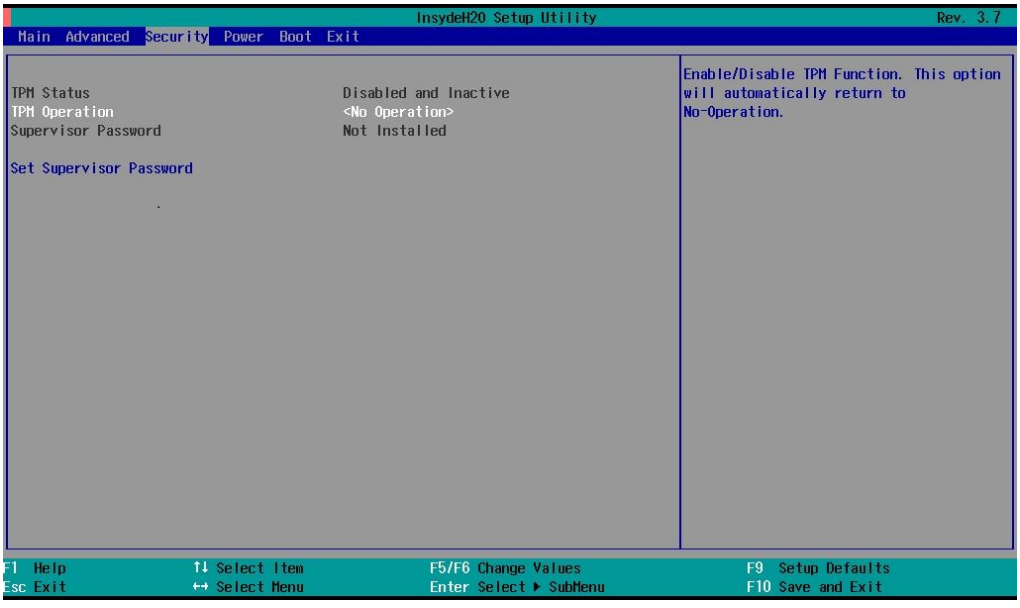
Hardware Monitor

This item allows you to view stats like CPU and system temperature, voltage levels, and other chipset information. Please note that the CPU fan will not start until the temperature is above 80 degrees Celsius.



Security Settings

This section allows users to configure security settings with a supervisor password and user password.



TPM Status

This item allows you to enable/disable the TPM function.

Options: Enable and Active (default), No Operation, Disable and Deactivate

TPM Operation

This item allows you to enable/disable the TPM Operation function.

Options: No Operation (default), Enable and Active, Disable and Deactivate

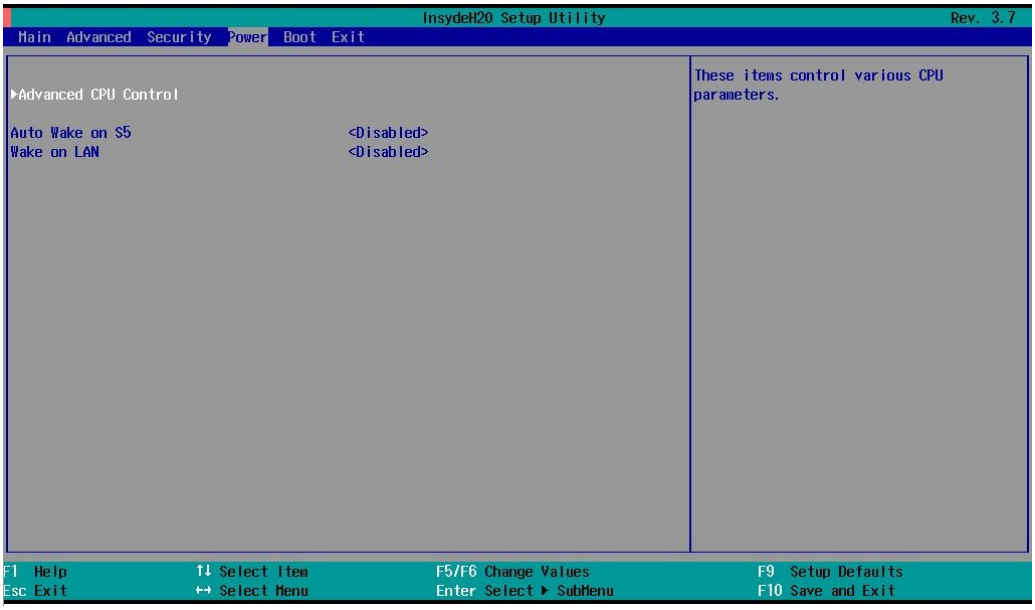
Set Supervisor Password

This item allows you set the supervisor password. Select and then enter the password, and then confirm the password again.

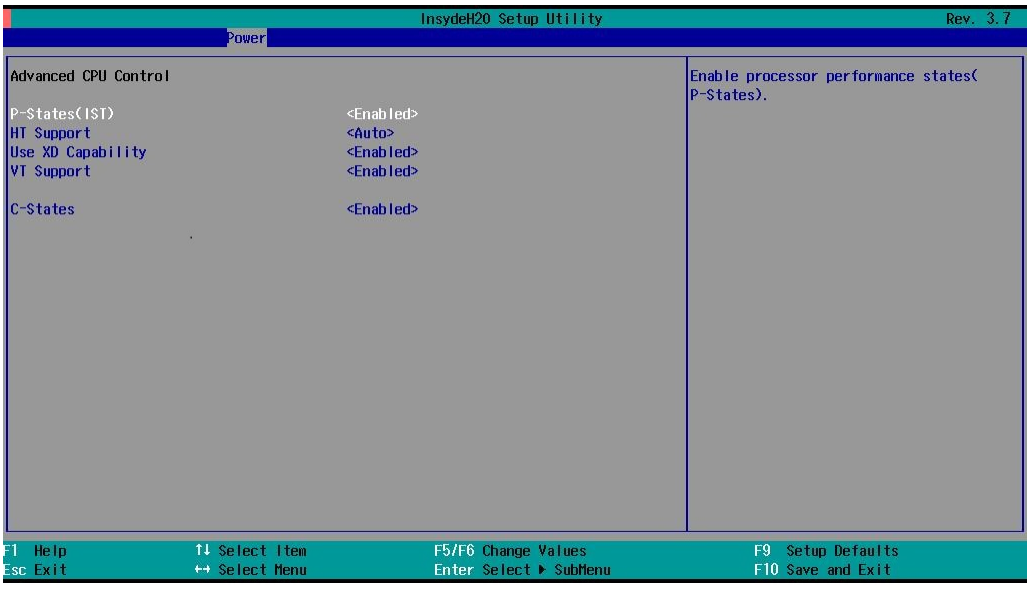
To delete the password, enter **Set Supervisor Password** and then enter the old password; then, leave the new password fields blank, and press enter.

Power Settings

The section allows users to configure power settings.



Advanced CPU Control



P-States (IST)

This item allows you to enable/disable **Processor Performance States** (P-States); these states allow you to choose the speed at which your processor will handle itself, thereby conserving energy during usage, or operating at the top speeds available (while consuming more energy).

Options: Disabled (default), Enabled

HT Support

This item allows you to disable **Hyper-Threading** (HT).

Options: Auto (default), Disabled

Use XD Capability

This item allows you to enable **XD** capability—the Execute Disable bit—in the processor. This will prevent the execution of code in data-only memory, giving some protection against buffer overflow attacks. It is recommended to enable this feature; however, some software applications (particularly device drivers) improve performance by executing some of their code from the kernel stack, and in these instances XD will cause page faults. In these cases, **XD** must be disabled.

Options: Disable (default), Enabled

VT Support

This item allows you to enable/disable Intel® **Virtualization Technology**, which gives additional hardware support when the system is running virtual operating systems.

Options: Enabled (default), Disabled

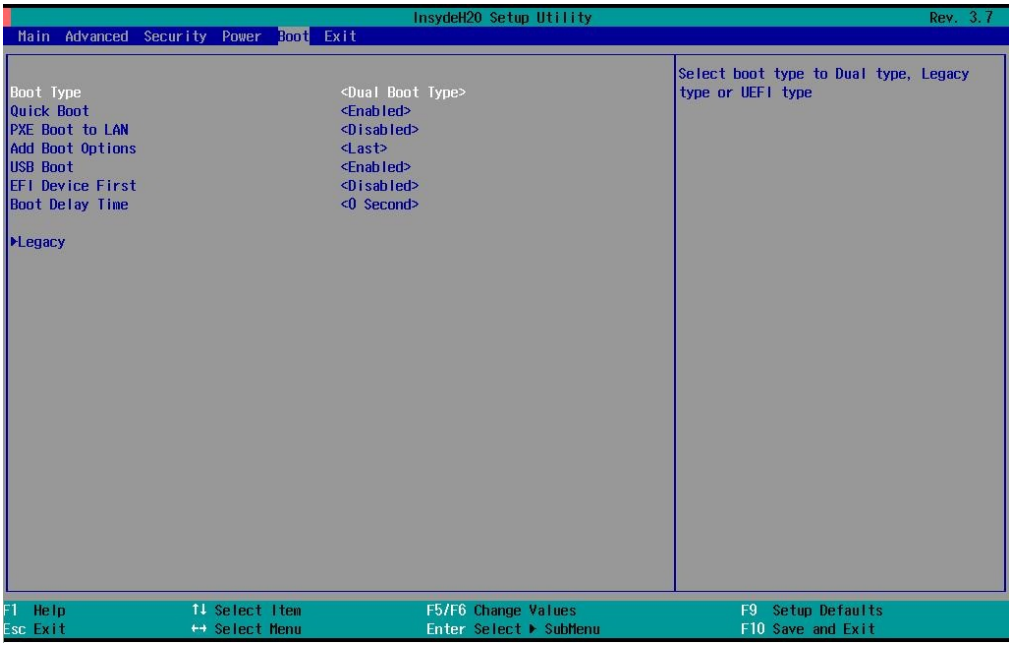
C-States

This item allows you to enable/disable the processor idling states; these C-States conserve energy when the processor is not being used (or not being fully used). This saves considerable energy when the system is idling, but at the cost of a slow wakeup for the system when it has been idling for a long time.

Options: Enabled (default), Disabled

Boot Settings

The section allows users to configure boot settings.



Boot Type

This item allows you to enable/disable quick boot function.

Options: Dual Boot Type (default), Legacy Type, UEFI Type.

Quick Boot

This item allows you to enable/disable quick boot function.

Options: Enabled (default), Disabled

PXE Boot to LAN

This item allows you to enable/disable PXE boot to LAN function.

Options: Disabled (default), Enabled

Add Boot Options

This item allows you to add the boot order options for shell, network and Removables.

Options: Last (default), First

USB Boot

This item allows you to enable/disable USB boot function..

Options: Enabled (default), Disabled

EFI Device First

This item allows you to determine EFI device first or legacy device first. If enabled, EFI device will be the first; if disabled, legacy device will be the first.

Options: Disabled (default), Enabled

Boot Delay Time

This item allows you to configure the delay time value for users to input hot key during POST time.

Options: 0 Second (default), 3 Seconds, 5 Seconds, 10 Seconds

Legacy

Normal Boot Menu

This item allows you to configure the boot menu.

Options: Normal (default), Advance

Boot Type Order

This item allows you to select the boot order. Use F5/F6 to change values.

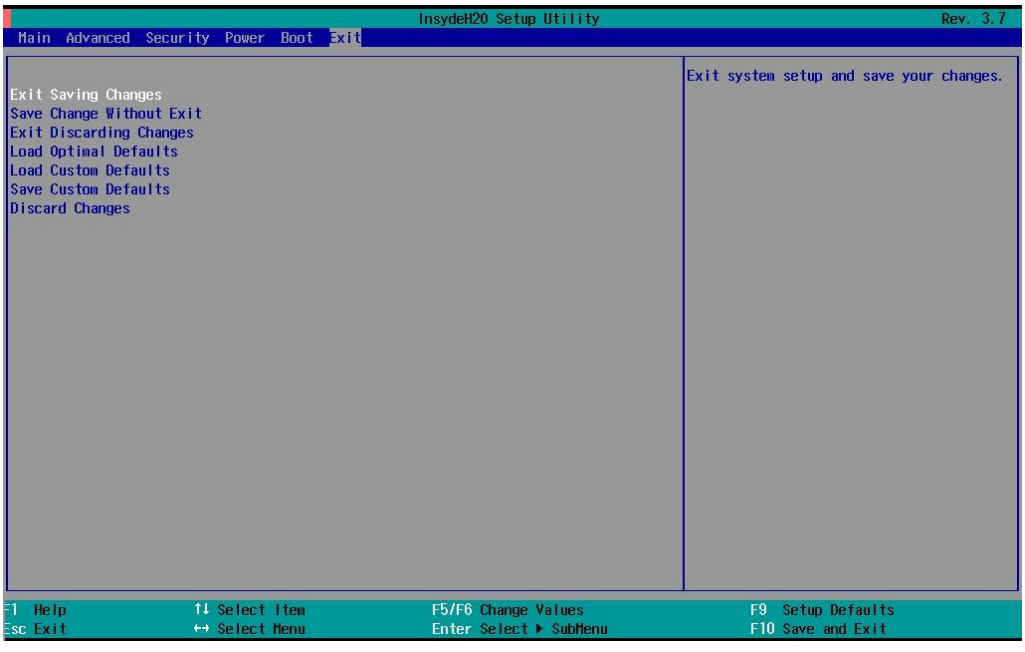
Options: Hard Disk Drive (default), CD/DVD-ROM Drive, USB, Others

Hard Disk Drive

This item allows you to view the hard disk drive installed in the computer.

Exit Settings

The section allows users to exit the BIOS environment.



Exit Saving Changes

This item allows you to exit the BIOS environment and save the values you have just configured.

Options: Yes (default), No

Save Change Without Exit

This item allows you to save changes without exiting the BIOS environment.

Options: Yes (default), No

Exit Discarding Changes

This item allows you to exit without saving any changes that might have been made to the BIOS.

Options: Yes (default), No

Load Optimal Defaults

This item allows you to revert to the factory default BIOS values.

Options: Yes (default), No

Load Custom Defaults

This item allows you to load custom default values for the BIOS settings.

Options: Yes (default), No

Save Custom Defaults

This item allows you to save the current BIOS values as a "custom default" that may be reverted to at any time by the "load custom defaults" selection just above.

Options: Yes (default), No

Discard Changes

This item allows you to discard all settings you have just configured.

Options: Yes (default), No

Upgrading the BIOS

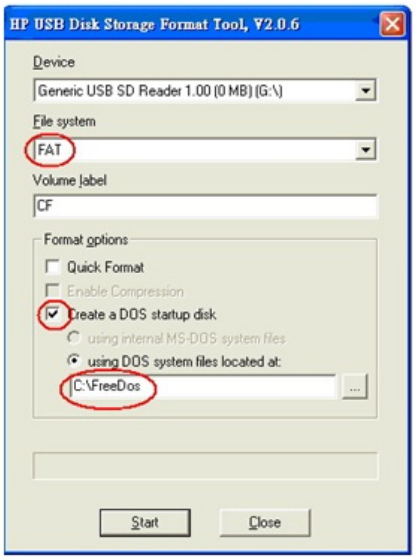
This section describes how to upgrade the BIOS. However, please note that upgrading the BIOS involves high risk of damage to your computer. We strongly recommend that you contact Moxa's TS staff for assistance and obtain all necessary tools and files before attempting to upgrade.

Step 1: Create a Bootable USB Disk

We suggest you use the HP USB Disk Format Tool to create a bootable USB disk. You may download this tool from the Internet. Search the Internet using the phrase "HP USB Disk Storage Format Tool", and then download the tool from one of the listed websites.

You will also need to download the FreeDos system files **kernel.sys** and **command.com** from http://www.freedos.org/kernel/.

1. Copy DOS system files **kernel.sys** and **command.com** to a specified directory (**C:\FreeDOS** in this example).
2. Start the HP USB Disk Storage Format Tool and select the USB device that you want to use as a bootable disk in the **Device** drop down box.
3. Select **FAT** in the **File system** drop down box.
4. Type the disk name in the **Volume label field**.
5. Check the option **Create a DOS startup disk** under format options.
6. Specify the directory of the system files (for example, **C:\FreeDOS**).
7. Click **Start** to format and create the USB disk.



ATTENTION

We suggest you use a USB drive with under 2 GB in disk space, as larger USB drives may not support FAT file format and consequently fail to boot.

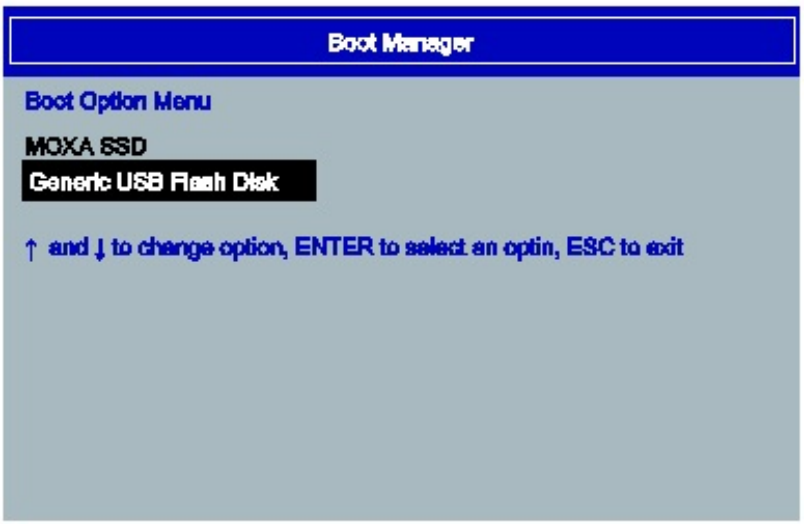
Step 2: Prepare the Upgrade File

You must use the BIOS upgrade installation file to upgrade the BIOS. Contact Moxa's technical department for assistance.

1. Get the BIOS upgrade installation file. The file name should have following format: **MC51xxSxx.exe** (xx refers to version numbers).
2. Copy the file to the Bootable USB Disk.

Step 3: Run the upgrade program on theMC-7130-MP Computer

1. Reboot the computer, press F12 while booting up to go to the Boot Manager
2. Select USB Disk as the first boot source. Press Enter to continue.



3. When boot up finishes, DOS screen will show up. Go to the directory where the upgrade file is located. For example, if the upgrade file is stored in the MC_7130 folder, type cd MC_7130

```
C:\cd MC_7130
```

4. Run the upgrade program by typing MC7130S03.exe. Please note that the upgrade filename may vary depending on the versions.

```
C:\ MC_7130>MC7130S01.exe
```

5. The upgrade program will be automatically performed. Please wait until the procedure to be finished.

```
C:\>70010s06
Reading file...
Flash package mode.
Option: -BIOS -C -Desc -ME

                    Please do not remove the AC power!


                Insyde Flash Utility for InsydeH2O
                                        Version 1.5t


                  Initializing

                  Current BIOS Model name: MC-7000
                  New     BIOS Model name: MC-7000

                  Current BIOS version: V1.00S06
                  New     BIOS version: V1.00S06


                  Updating Block at FFDE8000
```

6. When the upgrade is finished, the computer will automatically reboot. You may check the BIOS version in Main page of the BIOS Setup

MODEL NAME	MC-7130
BIOS Version	V1.00S06
Processor Type	Intel(R) Core(TM) i3 CPU 3120ME @ 2.40GHz

ATTENTION

Do NOT switch off the power supply during the BIOS upgrade, since doing so may cause the system to crash.

A

Regulatory Approval Statement

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Class A：FCC Warning! This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

European Community

Warning:

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

B

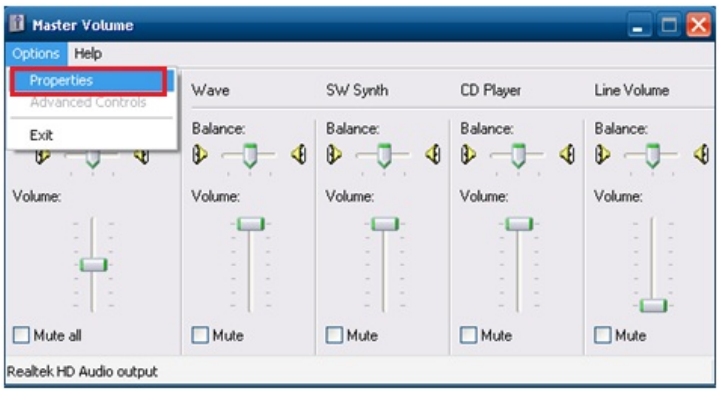
Adjusting the Audio Mixer Function

This chapter describes how to adjust the of the MC-7130-MP's audio settings for the **Mixer** function in the Windows XP and Windows XP Embedded operating systems.

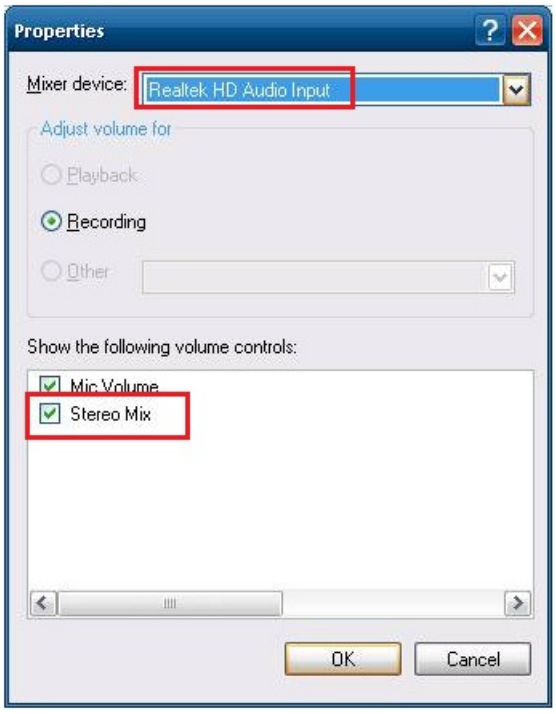
Since the **Mixer** function is enabled by default, you need modify the default settings of the Realtek audio device so that sounds picked up from the microphone will not be recorded. Follow the steps below:

1. Right-click volume icon and select **Open Volume Control**.

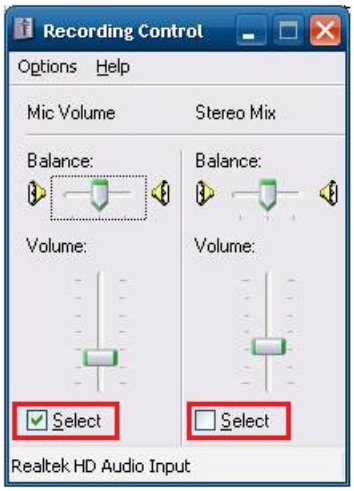
2. Select **Properties**.



3. Select **Realtek HD Audio Input** from the Mixer device drop-down list, and check **Stereo Mix**. Click **OK** to continue.



4. Uncheck **Stereo Mix** and choose **Mix Volume** to complete the configuration.

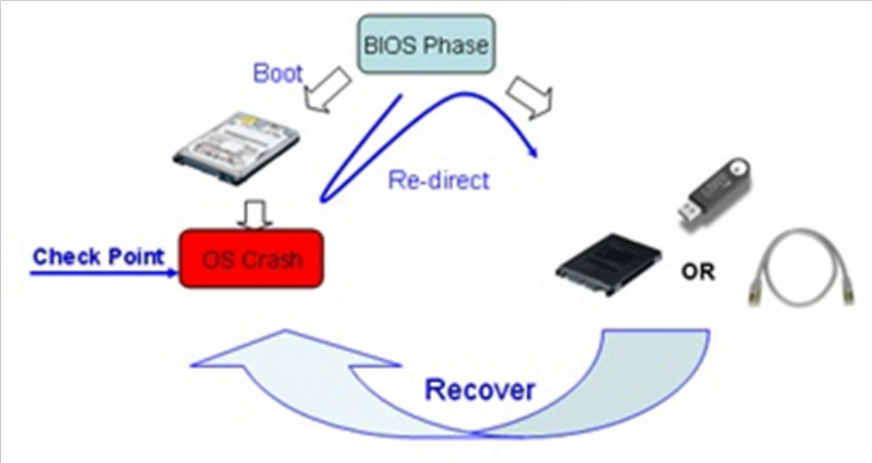


C

Smart Recovery

The MC-7130-MP provides Moxa's Smart Recovery™ software utility to enable automated system recovery whenever the operating system crashes.

File loss and operating system corruption can be a nightmare for computer users. Restoring a corrupt software system can be a nightmare when dealing with large or remote deployments.. Smart Recovery can create a back-up system to restore the operating system automatically. See the following figure for the main architecture of the recovery.

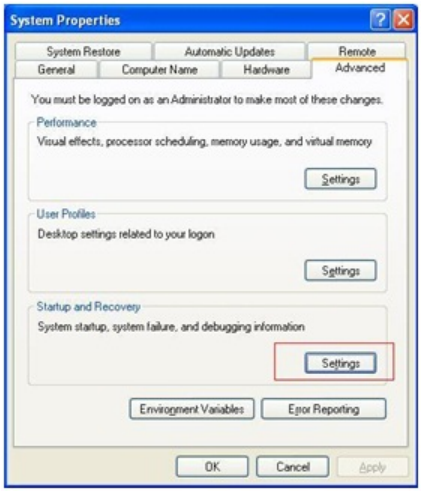


¶To run the Smart Recovery, do the following steps.

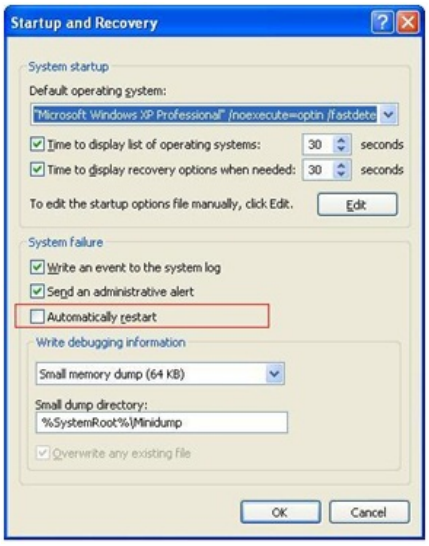
Modifying Basic OS Settings

To enable Smart Recovery with a Windows OS, you need to modify some basic settings.

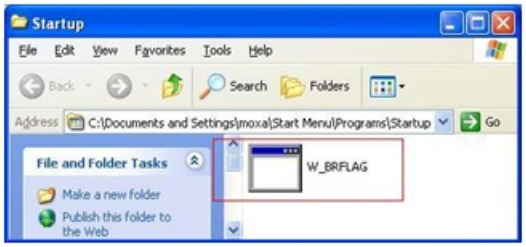
1. Select **Startup and Recovery from My Computer=>System Properties=>Advanced.**



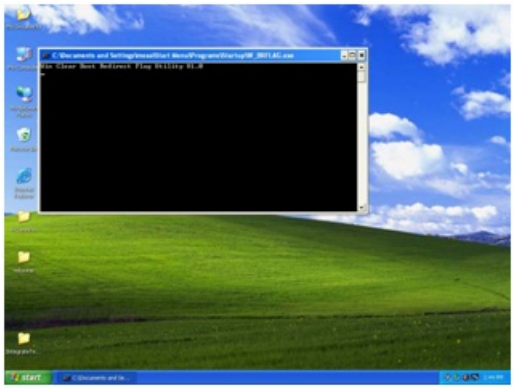
2. Uncheck **Automatically restart**.



3. Copy checkpoint utility **W_BRFLAG** to the system startup from the software CD path: **CD\utility_tools\Smart Recovery**.



4. The check point function will be enabled each time the system boots up.



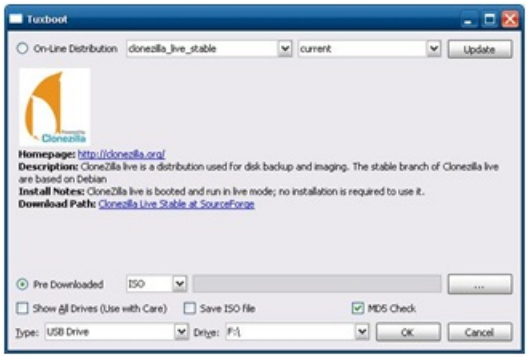
Recovery Procedure

Refer to the following steps for system recovery.

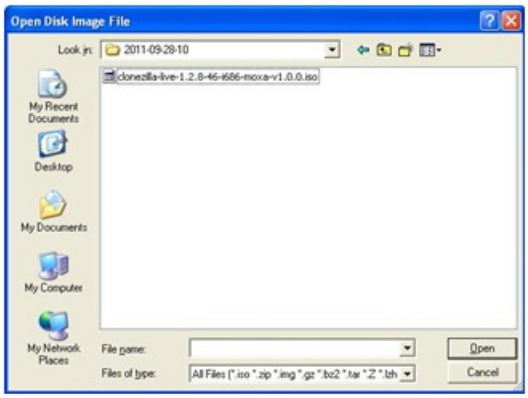
1. Prepare your USB drive

Prepare your USB drive by copying the Smart Recovery boot environment to your USB drive.

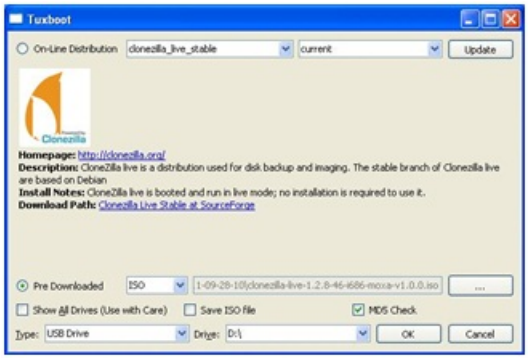
a. Start **tuxboot-windows-23.exe** and click **Pre Download**.


Tuxboot
On-Line Distribution
clonezilla_live_stable
current
Update
Homepage: http://clonezilla.org/
Description: CloneZilla live is a distribution used for disk backup and imaging. The stable branch of Clonezilla live are based on Debian
Install Notes: CloneZilla live is booted and run in live mode; no installation is required to use it.
Download Path: Clonezilla Live Stable at SourceForge
Pre Downloaded
ISO
Show All Drives (Use with Care)
Save ISO file
MD5 Check
Type: USB Drive
Drive: F:\
OK
Cancel

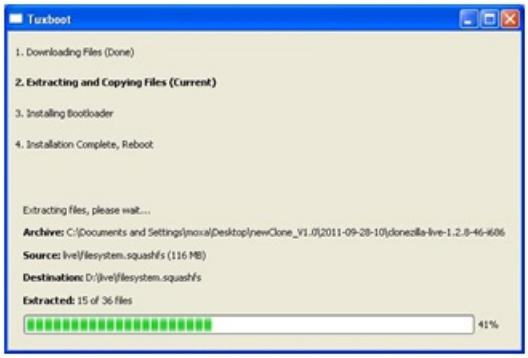
b. Select **ISO file** in the directory next to **tuxboot-windows-23.exe**.



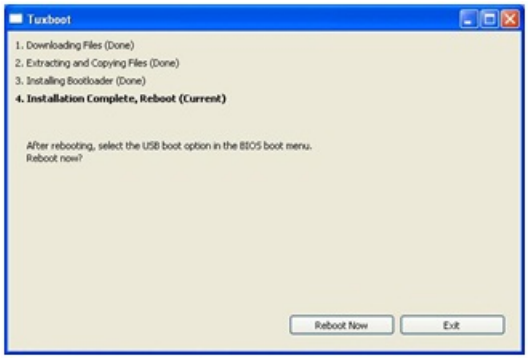
c. From the **Type** menu select **USB Drive**, then choose the USB's drive letter assignment and click **OK**.


Tuxboot
On-Line Distribution
clonezilla_live_stable
current
Update
Homepage: http://clonezilla.org/
Description: CloneZilla live is a distribution used for disk backup and imaging. The stable branch of Clonezilla live are based on Debian
Install Notes: CloneZilla live is booted and run in live mode; no installation is required to use it.
Download Path: Clonezilla Live Stable at SourceForge
Pre Downloaded
ISO
Show All Drives (Use with Care)
Save ISO file
MD5 Check
Type: USB Drive
Drive: D:\
OK
Cancel

d. The boot files will then copy to your USB drive



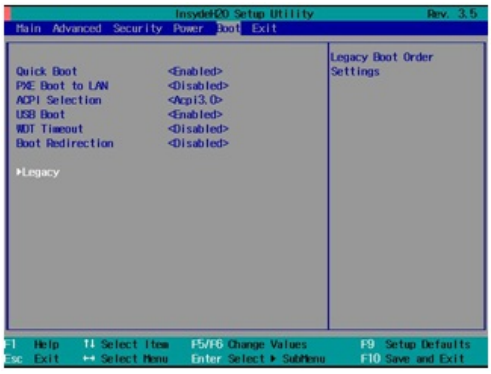
e. Click **Exit** to close the program.


Tuxboot
1. Downloading Files (Done)
2. Extracting and Copying Files (Done)
3. Installing Bootloader (Done)
4. Installation Complete, Reboot (Current)
After rebooting, select the USB boot option in the BIOS boot menu.
Reboot now?
Reboot Now
Exit

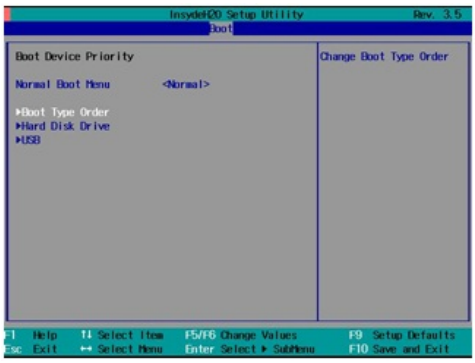
2. Change the BIOS setting to boot from the USB

Here, we will boot into the Smart Recovery boot environment. First, we must change the boot priority so that the system will boot from the USB drive. Before beginning the following steps, make sure your USB disk is already inserted into the computer.

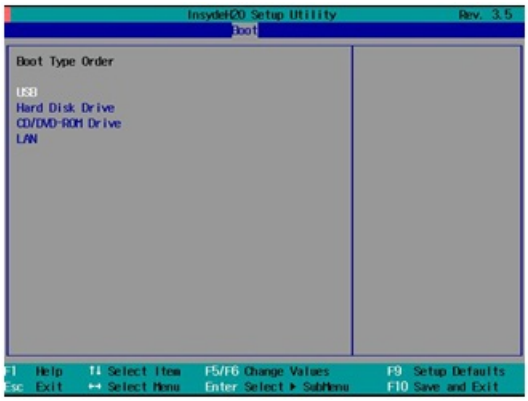
f. Power on and press **F2** to enter the BIOS setup menu.
Select **Legacy** and press **Enter**.


InsydeH2O Setup Utility Rev. 3.5
Main Advanced Security Power Boot Exit
Quick Boot <Enabled>
PXE Boot to LAN <Disabled>
ACPI Selection <Acpi3.0>
USB Boot <Enabled>
WDT Timeout <Disabled>
Boot Redirection <Disabled>
▶Legacy
Legacy Boot Order Settings
F1 Help ↑↓ Select Item F5/F6 Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ SubMenu F10 Save and Exit

g. Select **Boot Type Order** and press **Enter.**



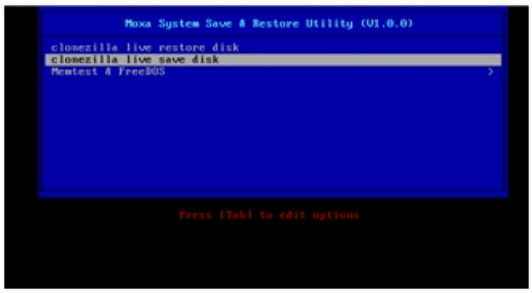
h. Press **+/-** to select USB as the first boot device type, then press **F10** and then **Enter** to save and exit BIOS setup.



The system will now boot into the System Recovery boot environment, from the USB disk.

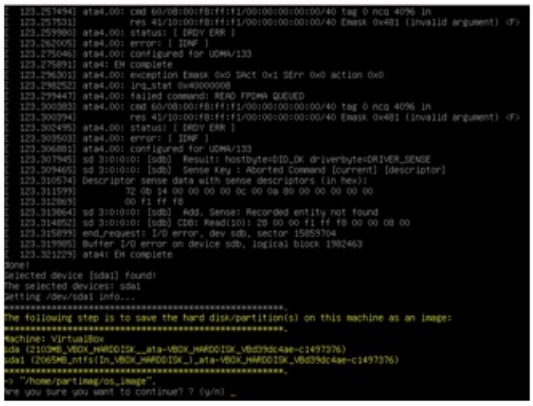
Install the Smart Recovery Utility into the OS

1. Select **clonezilla live save disk**.

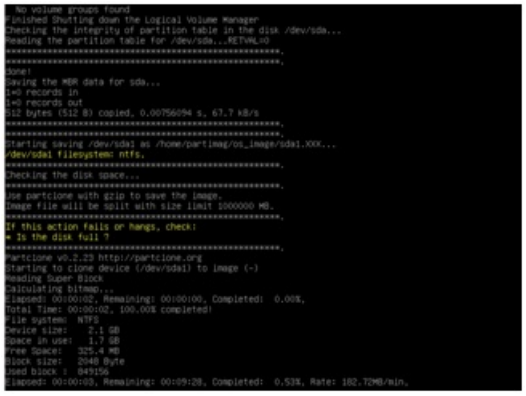

Moxa System Save & Restore Utility (V1.0.0)
clonezilla live restore disk
clonezilla live save disk
Memtest & FreeDOS
Press [Tab] to edit options

2. Wait for the USB drive boot process to complete.

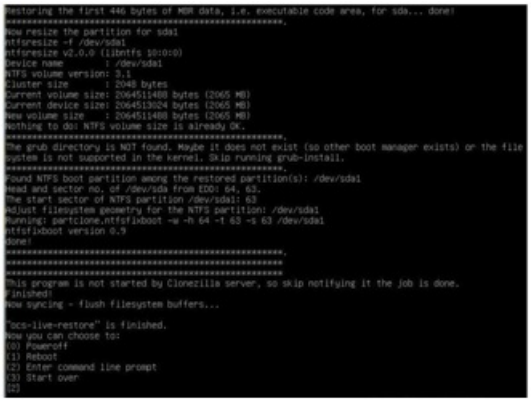
3. Enter **Y** to save the process.



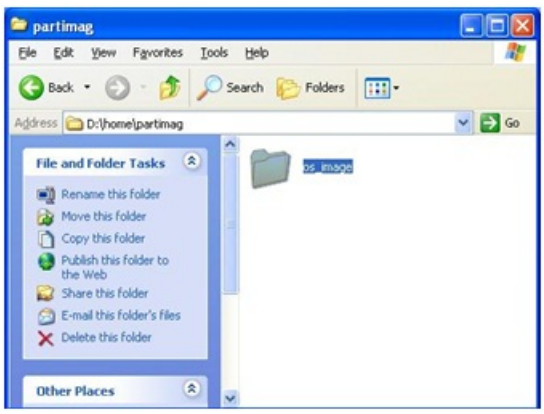
4. Wait for the process to be saved.



5. Select **(0)** to power off the computer after the restore process is complete.



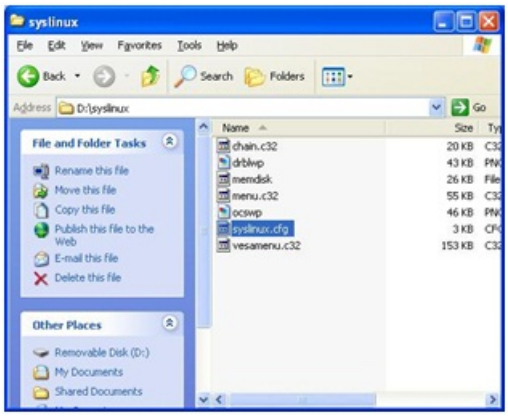
6. The system will save into the **os_image** folder of the USB disk **\home\partimag\.**



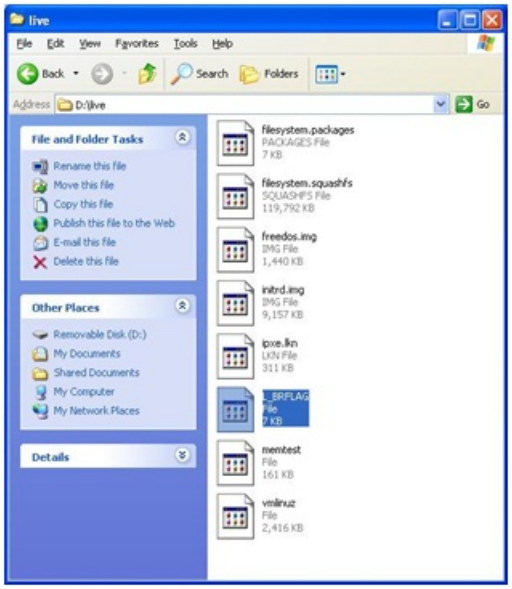
Modify the USB Drive to Serve as an Auto-Execute Restore System

Follow the steps below to modify the USB disk to an auto-execute restore disk:

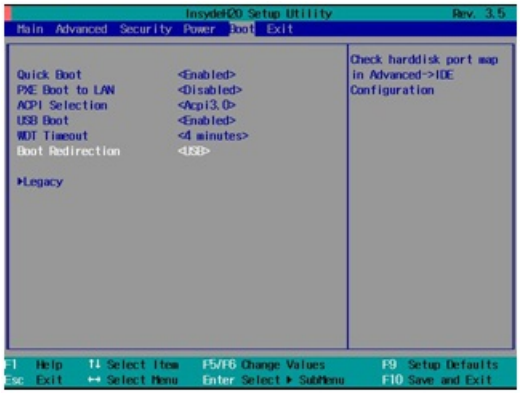
1. Copy **syslinux.cfg** from software CD path: **CD\utility_tools\Smart Recovery** to **USB \syslinux** and overwrite it.



2. Copy **L_BRFLAG** from the software CD path: **CD\utility_tools\Smart Recovery** to **USB\live**



3. When the system has powered on, press **F2** to enter BIOS setup utility; set **WDT timeout** to a suitable time length, and set **Boot Redirection** to **USB**.

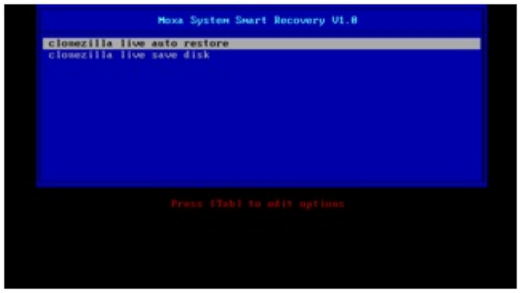


4. Users will still be able to use their OS.

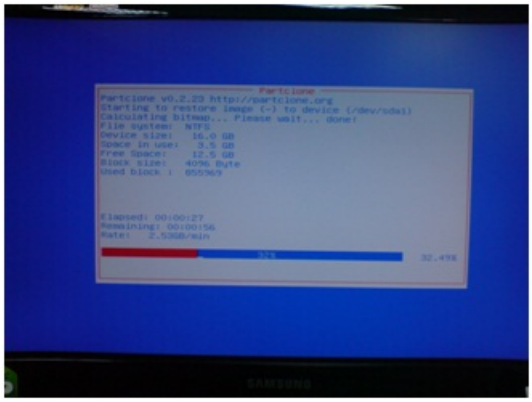
5. If the OS boot-up fails, system will display the blue screen. In this case, the watchdog timer will be counting down.

A problem has been detected and Windows has been shut down to pr
to your computer.
The end-user manually generated the crashdump.
If this is the first time you've seen this Stop error screen,
restart your computer. If this screen appears again, follow
these steps:
Check to make sure any new hardware or software is properly insta
If this is a new installation, ask your hardware or software manu
for any Windows updates you might need.
If problems continue, disable or remove any newly installed hardw
or software. Disable BIOS memory options such as caching or shado
If you need to use Safe Mode to remove or disable components, res
your computer, press F8 to select Advanced Startup Options, and t
select Safe Mode.
Technical information:
*** STOP: 0x000000E2 (0x00000000,0x00000000,0x00000000,0x00000000)

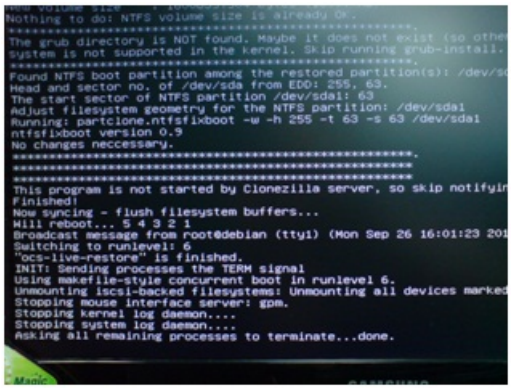
6. When the watchdog timer is up, the system will automatically restart and boot to the USB disk



7. Fully automatic setting will save **os_image** folder to the damaged hard disk drive.

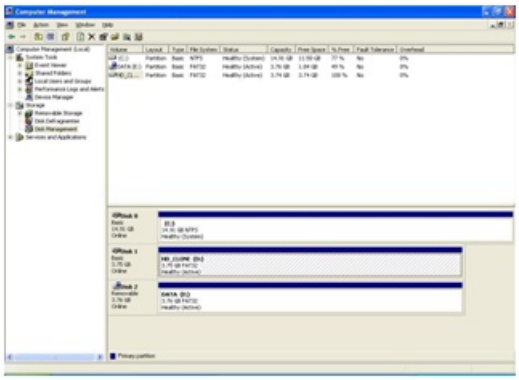


8. When the process is complete, the operating system will automatically restart into the primary OS.

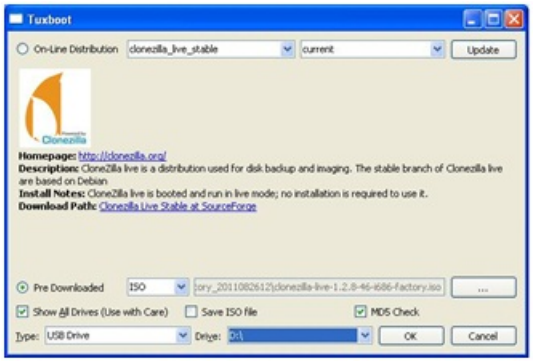

Nothing to do: NTFS volume size is already OK.
The grub directory is NOT found. Maybe it does not exist (so othe
system is not supported in the kernel. Skip running grub-install.
Found NTFS boot partition among the restored partition(s): /dev/s
Head and sector no. of /dev/sda from EDD: 255, 63.
The start sector of NTFS partition /dev/sda1: 63
Adjust filesystem geometry for the NTFS partition: /dev/sda1
Running: partclone.ntfsfixboot -w -h 255 -t 63 -s 63 /dev/sda1
ntfsfixboot version 0.9
No changes neccessary.
This program is not started by Clonezilla server, so skip notifyin
Finished!
Now syncing - flush filesystem buffers...
Will reboot... 5 4 3 2 1
Broadcast message from root@debian (tty1) (Mon Sep 26 16:01:23 201
Switching to runlevel: 6
"ocs-live-restore" is finished.
INIT: Sending processes the TERM signal
Using makefile-style concurrent boot in runlevel 6.
Unmounting iscsi-backed filesystems: Unmounting all devices marked
Stopping mouse interface server: gpm.
Stopping kernel log daemon....
Stopping system log daemon....
Asking all remaining processes to terminate...done.

Check the Following Items for Recovery from Hard Disk

1. Format the hard disk to FAT32 as disk1.

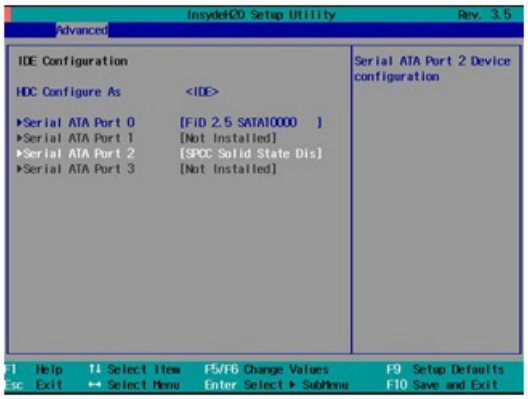


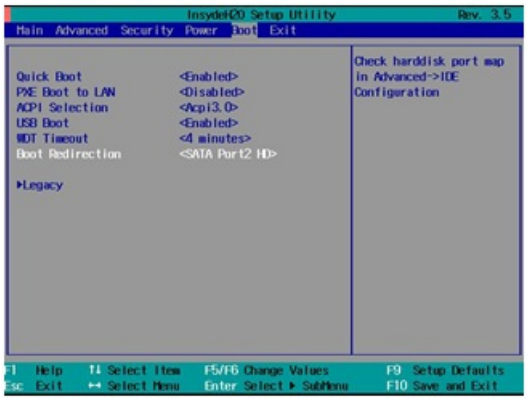
2. In Tuxboot, change the target drive to hard disk.


Tuxboot
On-Line Distribution
clonezilla_live_stable
current
Update
Homepage: http://clonezilla.org/
Description: CloneZilla live is a distribution used for disk backup and imaging. The stable branch of Clonezilla live are based on Debian
Install Notes: CloneZilla live is booted and run in live mode; no installation is required to use it.
Download Path: Clonezilla Live Stable at SourceForge
Pre Downloaded
ISO
Show All Drives (Use with Care)
Save ISO file
MD5 Check
Type: USB Drive
Drive:
OK
Cancel

3. Build the hard disk recovery image as USB. The boot redirection setting is different.

4. When the system has powered on, press **F2** to enter BIOS setup utility, check the hard disk connection port, set WDT timeout to a suitable time length, and set Boot Redirection to the mapped port. (For example, set system OS disk as Port 0, spare rescue disk as port 2).



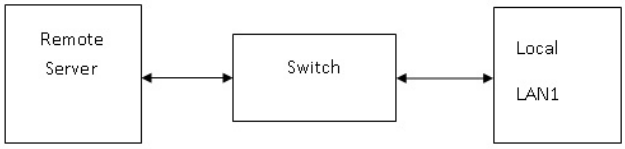


5. When finished, the hard disk will perform in the role of the USB to recover the operating system.

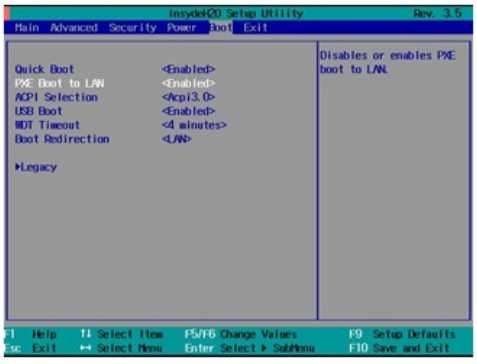
Check the Following Items for Recovery from LAN

1. Build the physical network link in remote server and the local device. See the following figure for details.

Connection in Local Network



2. Set PXE Boot to LAN Enabled, WDT Timeout as suitable time length and Boot Redirection to LAN.



3. For more information about remote server settings, refer to the Clonezilla web site: http://clonezilla.org/
4. When set up is completed, your USB drive can work as an additional USB/SSD.